Vol. XXVI. Part 1.

[Registered at the General Post Office, Melbourne, for transmission by Post as a Newspaper.]

The Journal of the Department of Agriculture of Victoria, Australia.

January, 1928.

PRINCIPAL CONTENTS

Fresh Grape Shipments

Problems in Horticulture Needing Investigation

Experimental Potato Trials

List of Fertilizers Registered for 1928

Crop Competitions

PRICE THREEPENCE. (Annual Subscription—Victoria, Interstate, and N.Z., 3/-; British and Foreign, 5/-.)

Sow Brunning's Selected and Improved Strain of Genuine, English Grown, Broad-leaved

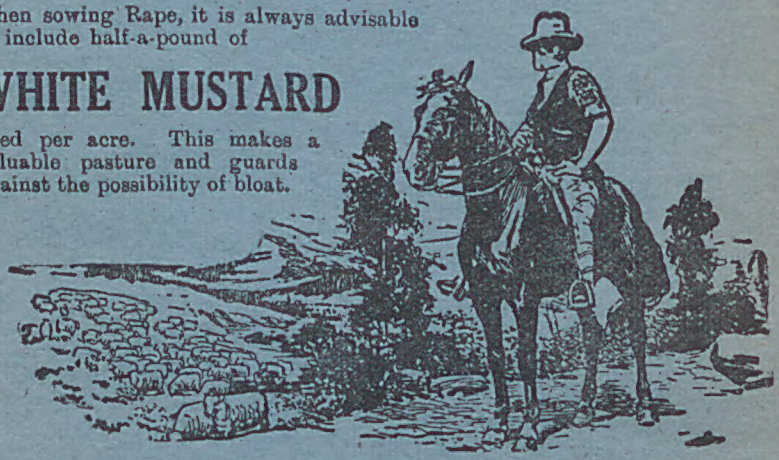
DWARF ESSEX RAPE

Rape is valuable for pasturing sheep, cattle and pigs, for green manuring and for oil. Makes excellent green manure when ploughed under, and can also be cut and fed if required instead of being grazed. Adds nitrogen to the soil, and cleanses the land of weeds. It will fatten from 10 to 30 sheep per acre according to the crop.

When sowing Rape, it is always advisable to include half-a-pound of

WHITE MUSTARD

Seed per acre. This makes a valuable pasture and guards against the possibility of bloat.



CHOU MOELLIER

(Marrow-stemmed Tree Kale)

This rapid growing Kale is highly esteemed as a milk producer, not only on account of its feeding value, but because it does not taint like many other fodders.

THOUSAND-HEADED KALE

Excellent for fattening cattle, pigs, and horses, and extremely valuable for dairy farmers. Suitable for growing throughout Southern Victoria and in districts with a similar or cooler climate. Does not cause sheep or lambs to scour or blow.

Further particulars and quotations, post free on request

BRUNNINGS

F. H. BRUNNING Pty. Ltd.

New Address: 57 Elizabeth St., MELBOURNE

7/2/29

NATIONAL MUSEUM VICTORIA

[Supplement to *The Journal of the Department of Agriculture, Victoria, January*, 1929.]

G. R.

THE JOURNAL

OF THE

DEPARTMENT OF AGRICULTURE

OF

VICTORIA,

AUSTRALIA.

PUBLISHED FOR AND ON BEHALF OF THE GOVERNMENT BY DIRECTION OF THE

HON. J. W. PENNINGTON, O.B.E., M.L.A.,

Minister for Agriculture.

The articles in the Journal of the Department of Agriculture of Victoria are protected by the provisions of the Copyright Act. Proprietors of newspapers wishing to republish any matter are at liberty to do so, *provided the Journal and author are both acknowledged.*

VOLUME XXVI.

1928.

By Authority:

H. J. GREEN, GOVERNMENT PRINTER, MELBOURNE.

1929.

16232.

THE JOURNAL OF THE DEPARTMENT OF AGRICULTURE, VICTORIA.

VOLUME XXVI. Parts 1—12.

INDEX.

	Page
Agricultural Credit in South Africa	377
Ants, White	453
Apiculture—	
Bees and Pollination of Fruit Trees	124
Foul Brood in Bees	657
Queen Bees, Breeding of ...	435
Apples—	
Black Spot of	734
Cold Storage of	609
Manurial Experiments ...	735
Packing of	240
Preserving of	97
Varieties Exported during 1928 Season	424
Apricot Scab or Shot-hole 310,	734
Apricots—Varieties Best Suited for Canning	5
Argentine—	
Beef Export Trade	427
Export Trade in Canned Meats	431
Asparagus—	
Growing of	557
Preserving of	618
Bacon-curing	120
Bannerton Fallow Competition	225
Barley—Value of as Stock Food	526
Bartels, L. C.—	
Birchip Crop, &c., Competition	88
Cohuna Farm Competition, 1928	268
Donald Crop, &c., Competition	85
Irrigated Pastures	111
Sowing Permanent Crops ...	261
Top-dressing Lucerne 397,	598
Bartels, L. C. (and Beruldsen, E. T.)—	
Lucerne Top-dressing Tests ...	489
Beans—Manures for	309
Beauchamp Crop, &c., Competition	161
Bees and Pollination of Fruit Trees	124
Bees, Queen, Breeding of ...	435
Beruldsen, E. T.—	
Irrigated Pastures	718
Beruldsen, E. T. (and Bartels, L. C.)—	
Lucerne Top-dressing Tests ...	489
Benalla Crop, &c., Competition	150
Birchip Crop, &c., Competition	88
Book Lice	457
Boort Crop, &c., Competition ...	30
Borer of Stone Fruit	232
Bowman, N. A.—	
Care of Ewes at Lambing Time	392
Fat Lamb Raising	257
Brake, J.—	
Warracknabeal Crop, &c., Competition	203
Western Mallee Crop, &c., Competition	206
Bran—Value of as Stock Food ...	525
Brewers' Grain—Value of as Stock Food	527
Brown Rot in Stone Fruits ...	733
Butter, Australian, Exports, 1927-28	631
Calf—Lactation in	137
Calf Club—Dollar	134
Canadian Wonder Beans ...	309
Caniambo Crop Competition, 1928	722
Carpet Beetle	455
Castella, F. de—	
Cider Making	356
Fresh Grape Shipments ...	15
Madeira	577
Salads	241
Vineyard Tillage	72
Viticulture—Seasonal Hints ...	661
Catani Potato Trials	478
Charlton Crop, &c., Competition	295
Cheese, Australian, Exports for 1927-28	631
Chemistry, Dairy	645
Chemistry in Agriculture 385, 449,	641
Cherry Slug 231,	733
Childers Potato Trials ...	474
Cider Making	356

Page

Citrus—
Manuring Washington Navel Oranges 588
Rind Marking—Finding the Cause 549
Valencia Late Orange—Colouring by Ethylene Gas ... 41
Colouring Artificially ... 41
Clark, A. G. (and Frederick, W. O.)—
Poultry Feeding Experiments (Dried Milk and Meat Meal) 99
Clover—
Alsike 113
English Wild White ... 114
Llandino 115
Mixture of Clover and Grasses suggested 719
Red 113, 530
Strawberry 116
Subterranean 115
White 113
White Dutch 114
Clinton, H. F. (and Rugg, W. C.)—
Burnley Egg-laying Competition, 1927-28—Report on ... 321
Cock, S. A.—
Rind Marking of Citrus Fruits 549
Coconut Oil Cake 528
Cod Liver Oil—Feeding to Cows 668
Codling Moth—Control of 231, 459
Cohuna Farm Competition ... 268
Coleraine Potato Crop Competition 418
Concentrates—Feeding of to Cows 524
Cotton-seed Meal—Value of as a Stock Food 527
Coutts, G. C.—
Charlton Crop, &c., Competition 295
Cows—
Best Time to Bring into Milk 472
Feeding 472, 513, 515
Necessity for Minerals ... 518
Ration, Balanced 522
Yields of Cows in Standard Herd Tests since its Beginning (Graphs) 534
Cream Deterioration 129
Crop and Fallow Competitions—
Beauchamp 161
Birchip 88
Boinka 206
Boort 30
Charlton 295
Dimboola 292
Donald 85
Galah 206
Jeparit 213
Nhill 138
North-Eastern Mallee ... 197

Page

Crop and Fallow Competitions—*continued.*
Quambatook 33
Rupanyup 288
Walpeup 206
Wangaratta 156
Warracknabeal 203
Yarrawonga 91
Crop Competitions—
Benalla 150
Kenley 198
Kerang 36
Liparoo 199
Moss Tank 199
Pier Millan 199
Rutherglen 153
Willaura 222
Winnambool 197
Crops and Soil 388
Crops for Green Manure ... 434
Cut Worms 602, 652
Dahlenburg, E. W.—
Dimboola Crop, &c., Competition 292
Dairy Building — Whitewashes for 488
Dairy Chemistry 645
Dairy Classes at Camperdown ... 410
Dairy Farming in South Gippsland 402
Dairy Industry in Ireland ... 697
Dairying—
Balanced Ration 522
Best Time to Bring Cows into Milk 472
Cleanliness—Necessity for ... 571
Concentrates—Feeding of ... 524
Economical Feeding of Stock 513
Feeding for Profit 472
Feeding of Dairy Cows ... 515
Davey, H. W.—
Control of Orchard Insect Pests 230
Green Manuring Orchard Trees 432
Orchard Drainage 428
Orchard Summer Sprays ... 731
Daylesford Potato Competition ... 364
Dimboola Crop, &c., Competition 292
Dollar Calf Club 134
Donald Crop, &c., Competition 85
Drainage, Orchard 428
Ducks—Heavy Laying in Winter Tests at Burnley 566
Eagland, J. S.—
Breeding of Queen Bees ... 435
Foul Brood in Bees 657
Eat More Fruit Swedish Campaign 633
Egg-laying Competitions—
Burnley, 1927-28—Report on ... 321
Uniform Standard of Allotting Prizes desirable 322
Winter Tests at Burnley, 1928 566

Page

Entomology—
- Ant Lion 655
- Ants, White 453
- Aphids 651
- Apple Moth, Light-brown ... 649
- Apple Moth, Painted ... 650
- Book Lice 457
- Borer of Stone Fruit Trees ... 232
- Braconids 656
- Bryobia Mite 603
- Carpet Beetle 455
- Caterpillars, Bacterial Disease of 602
- Chalcids 656
- Codling Moth ... 231, 459
- Cutworms 602, 652
- Fern Aphids 651
- Fleas 458
- Ichneumons 656
- Insects, Domesticated ... 654
- Introduction of Insects ... 653
- Lacewings 655
- Ladybird 655
- Light-brown Apple Moth ... 649
- Looper Caterpillars 649
- Loss caused by Insects in U.S.A. 563
- Mealy Bugs 651
- Millipedes 651
- Mites 603
- Painted Apple Moth ... 650
- Pea Mites 603
- Peach Aphis 233
- Pear and Cherry Slug ... 231
- Pear Root Aphis 232
- Plant Insect Pests—Control of 601
- Predators and Parasites ... 654
- Red Spider 603, 650
- Root Borer 548
- Rutherglen Bug 652
- Scale Insects 651
- Silverfish 456
- Snails and Slugs 652
- Stick Case Moth 649
- Syrphid Flies 655
- Tachnid Flies 655
- Take-all Grubs 651
- Thrips, Black 651
- Tomato Weevil 650
- White Ants 453
- Woodlice 652
- Woolly Aphis 232

Ewes—
- Care of at Lambing Time ... 392
- Purchase of 257

Fallow Competitions—
- Bannerton 225
- Liparoo 203
- Manangatang 201
- Moss Tank 203
- North-Eastern Mallee ... 227
- Numurkah 283
- Pier Millan 202
- Sydenham 285
- Wangaratta 361
- Wemen 203

Page

Fallow and Crop Competitions—
- Beauchamp 161
- Birchip 88
- Boinka 206
- Boort 30
- Dimboola 292
- Donald 85
- Galah 206
- Jeparit 213
- Nhill 138
- North-Eastern Mallee ... 197
- Quambatook 33
- Rupanyup 288
- Walpeup 206
- Wangaratta 156
- Warracknabeal 203
- Yarrawonga 91

Farm Buildings—
- Sheep Dip 245

Feeding off Tests 710

Fertilizers Act 1928—Explanatory Notes on 740

Fertilizers, Artificial—
- List of those collected and analyzed during six months ended 31st December, 1927 238
- List of those registered for 1928 ... ... 42, 439
- Notes on operation of Act for six months ended 31st December, 1927 237

Fertilizers, Nitrogenous ... 449

Fincher, F.—
- Successful Dairy Farming in South Gippsland 402

Fish, S.—
- Scab or Shot-hole of Apricots —Result of 1927 Experiments 310

Fleas 458

Fodder Crops in South Gippsland 402

French, C.—
- Control of Plant Insect Pests 601
- Insect Pests 649

Fruit Export—
- Reasons for Rejecting Fruit Intended for Export ... 426
- Review of 1928 Season ... 421

Fruit Packing—
- Apples 240

Fruit Storage (Cold) 609

Fruit Season, 1928—Review of ... 421

Fruit Tree Pests—
- Apricot-Shot-hole or Scab 310, 734
- Black Spot 734
- Borer of Stone Fruit Trees ... 232
- Brown Rot in Stone Fruits ... 733
- Cherry Slug ... 231, 733
- Codling Moth ... 231, 459
- Leaf Curl 728
- Peach Aphis ... 233, 728, 734
- Pear Root Aphis 232
- Pear and Cherry Slug ... 231, 733
- Root Borer 548
- Rutherglen Bug 733

Page

Fruit Tree Pests—*continued.*
Scab of Apricot ... 310, 734
Shot-hole 310
Woolly Aphis 232
Fruit Trees—
Diseases—*See* Fruit Tree Pests.
Experiments (Manures) on Apple Trees 735
Green Manuring of 432
Manurial Experiments ... 735
Manuring of 432
Productivity of 5
Pollination of ... 5, 124
Spraying Experiments — Codling Moth 459
Spraying Experiments — Peach Aphis and Leaf Curl ... 728
Sprays, Summer 731
Stocks 1
Variability of Yields ... 735
Water Requirements of ... 6
Gedye, H. M.—
Starting a Poultry Farm ... 414
Gill, A. J.—
Herd Test Records—Their Use and Misuse 171
Pig Feeding Experiments ... 624
Standard Herd Test—Report for 1927-28 513
Grapes—
Packing Experiments ... 22
Shipments to London ... 15
Shipments to New York ... 21
Shipments to Vancouver ... 21
Storage at Government Cool Stores 22
See also Viticulture.
Grasses—
Alsike Clover 113
Cocksfoot 118
Cow Grass 113
English Wild White Clover ... 114
Irrigated 111, 718
Llandino Clover 115
Mixture of Grasses and Clovers suggested 113, 719
Prairie 118
Red Clover 113
Rye (Perennial) 117
Strawberry Clover 116
Subterranean Clover ... 115
Top-dressing 113, 248, 715, 720
White 113
White Dutch 114
(*See* also Pastures.)
Gypsum—
Trials at Willaura 274
Value of 398
Hackwell, A. B.—
Jeparit Crop, &c., Competition 213
Rupanyup Crop, &c., Competition 288
Hammond, A. A.—
Peach Aphis and Leaf Curl ... 728
The Root Borer 548
Harrison, J. E.—
Kerang Crop Competition ... 36

Page

Hay—Value of as Stock Feed—
Lucerne 531
Meadow (Red Clover) ... 531
Meadow (Clover and Rye Grass) 531
Oaten 531
Wheaten 531
Heifer Calf—Lactation in ... 137
Herd Testing—
In America 471
In Sweden and Finland ... 470
Records—Their Uses and Misuses 171
(*See* also Standard Herd Test.)
Horse Breeding Acts—Regulations under 305
Horticulture—Problems Needing Investigation 1
Illowa Potato Trials 483
Insect Pests—
Garden 649
Household 453
Insect Friends 653
Irrigation—
Border System 595
Lucerne under 594
Methods 594
Pastures under ... 111, 718
Jewell, W. R.—
Amending *Fertilizers Act* 1928 (No. 3597) — Explanatory Notes 740
Chemistry in Agriculture 385, 449, 641
Fungicides Act—Analyses of Inspection Samples ... 462
Notes on Operation of *Fertilizers Act* 1915 for six months ended 31st December, 1927 237
Kendall, E. A.—
Registration of Stallions—Annual Report 298
Keir, J. M.—
Cream Deterioration ... 129
Kerang Crop Competition ... 36
Knight, Miss A.—
Apple and Plum Preservation 97
Salads 693
Some Uses for Preserved Fruit, &c. 495
Knight, Miss M.—
Vegetable Preservation ... 617
Korumburra Potato Trials ... 476
Krone, B.—
Packing of Apples 240
Lamb Raising 257
Lambing Time—Care of Ewes ... 392
Lambs—
Hand Feeding 395
Marking of 395
Levick, G. P.—
Codling Moth Control ... 459
Household Insect Pests ... 453
Our Insect Friends 653

	Page
Lienert-Todd Trophy—Result of	146
Linseed Meal—Value of as Stock Feed	527
Longerenong College—Wheat Experiments at	38
Lucerne—	
Grading of Land	262
Implements for Grading ...	265
Irrigation	594
Preparation of Seed-bed ...	266
Profits from Top-dressing ...	400
Results in Experimental Plots	398
Should it be included in Pastures	117
Soil from Old Lucerne Paddock Valuable for New Lucerne Paddock	433
Top-dressing ... 397, 489,	598
Top-dressing Tests—	
Cohuna 493,	495
Swan Hill ... 491,	494
Tongala 492,	494
Lucerne Tree, Giant	380
Madeira	577
Maize Experiments at Orbost ...	605
Maize—Value of as Stock Feed 525,	529
Maize Oil Meal—Value of as Stock Feed	525
Mallee Agricultural Convention, 1928—Proceedings to be Published	717
Mann, J. B.—	
Beauchamp Crop, &c., Competition	161
Manures. (*See* Fertilizers.)	
Manurial Trials—	
Feeding off and Green Tests	710
Marks, G. E.—	
Curing of Tobacco Leaf	187
Meeking, E.—	
Cold Storage of Apples ...	609
Metals and their Influence on Milk	679
Milk—	
Composition of	645
Influence of Metals on ...	679
Milk Recording Movement in other Countries	119
Millbrook Potato Trials 8,	542
Miller, W. B.—	
Crop Competitions in North-Eastern Victoria	148
Wangaratta Fallow Competition	361
Molasses—Value of as Stock Food	528
Morris, P. F.—	
A Harmful Weed—Salsafy ...	26
Mullett, H. A.—	
Greater Wheat Production—Sowing the 1928 Crop ...	164
Manures for Oats	169
Technique in Field Trials ...	65
The Season's Opportunities ...	193
Western District Wheat Yields	272
Musk Potato Trials	484
McCrae, P. D.—	
Sydenham Fallow Competition	285
McKenzie, R. T.—	
Whitewash for Farms ...	488
Nhill Crop, &c., Competition	138
Nitrate, Chilean	450
Nitrogen in Agriculture ...	450
Nitrogen, Fixation of	450
North-Eastern Mallee Crop Competition	197
Numurkah Fallow Competition	283
Oats, Gristed, Value of as Stock Food	525
Oats—	
Manures for ... 169,	712
Variety Trials at Carwarp ...	281
Oranges—	
Colouring by Ethylene Gas ...	41
Manuring Trials	588
Rind Marking of	549
Orbost—Maize Experiments at	605
Orchard Diseases, &c.—	
Apricot Scab ... 310,	734
Black Spot	734
Borer of Stone Fruit Trees ...	232
Brown Rot of Stone Fruits ...	733
Cherry Slug ... 231,	733
Codling Moth ... 231, 459,	732
Leaf Curl	728
Peach Aphis ... 233, 728,	731
Pear and Cherry Slug 231,	733
Pear Root Aphis	232
Root Borer	733
Rutherglen Bug	733
Scab of Apricot	310
Shot-hole of Apricot 310,	734
Woolly Aphis	232
Orchard Drainage	428
Orchard Trees—	
(*See* Fruit Trees.)	
Parasites in Pigs	406
Pastures—	
Food Values of Grass in Certain Districts	532
Grading the Land	262
Grazing Methods	721
Growth of	269
Implements for Grading ...	265
Irrigated 111,	718
Korumburra — Experiments in Top-dressing	248
Mixture Recommended for Different Soils	196
Plants for 113,	719
Preparation of Seed-bed 266,	718
Preparing the Ground 261,	718
Top-dressing 113, 248, 715,	720
Value of in Dairying ...	531
(*See* also Grasses.)	
Peach Aphis 233, 728,	731
Peaches—Best Varieties for Canning	4
Pea Meal—Value of as Stock Food	527

	Page
Pea Mite	603
Pear and Cherry Slug ...	231
Pear—Black Spot of	734
Pear Root Aphis	232
Pederick, W. O. (and A. G. Clark)—	
Poultry Feeding Experiments (Dried Milk and Meat Meal)	99
Penman, F.—	
Dairy Chemistry	645
Pescott, E. E.—	
Asparagus	557
Pig Industry—	
Danish	608
Scottish	57
South African	441
Pigs—	
Farrowing Pen	628
Feeding Experiments—	
Pakenham	624
British	629
Parasites in	406
Pinkerton Bros.—Farm of ...	402
Plums—Preserving of	97
Pollard—Value of as Stock Food	525
Pollination of Fruit Trees ...	5
Pollyfood—Value of as Stock Food	525
Potatoes—	
Boxed and Bagged Seed	11, 547
Coleraine Competition ...	418
Cultivation Test	11
Daylesford Competition ...	364
Experiments at—	
Catani	478
Childers	474
Illowa	483
Korumburra	476
Millbrook	8, 542
Musk	484
Trentham	540
Warragul	481
Wheatsheaf	484
Green Manure and Bare Fallow Trials	12
Immature and Ripe Seed	12, 544
Imported and Home-grown Seed	10, 546
Manure Trials	12, 13, 474, 540
Nitrate of Soda—Treating Seed with	13
Romsey Competition (Early) ...	318
Seed—Is Change Necessary?	546
Selected Seed Trial ...	11, 544
Spacing Test	9
Stock Food—Value of ...	528
Time of Cutting Seed Test ...	9
Varietal Trials ...	13, 540
Poultry—	
Breeding of	411
Breeding Stock—Guide to ...	413
Burnley Competition, 1927-28—Report	321
Cost of Starting Poultry Farm	415
Dairy Farms—Poultry on ...	107

	Page
Poultry—*continued.*	
Diseases—	
Chicken Pox	465
Early Hatching Essential ...	466
Eggs—	
Disposing of	664
Increasing Local Consumption	666
Size—Reasonable	665
Export Trade—Why it is Essential	467, 664
Fattening of	468
Feeding—	
Cost of	416
Value of Greenstuff ...	109
Feeding Experiments—	
Dried Milk and Meat Meal	99
Greenstuff—Value of as Feed	109
Housing on Farm	107
Manure—Value of	110
Poultry Rearing—Is it Profitable?	107
Poultry Farm—Starting of ...	414
Poultry Farming—Capital Required to Start	415
Shade for	331
Provan, J. L.—	
Manuring Washington Navel Oranges	588
Quambatook Crop, &c., Competition	33
Queen Bees—Breeding of ...	435
Rabbit in Australia	121
Ramsay, J. T.—	
Coleraine Potato Crop Competition	418
Daylesford Potato Crop Competition	364
Experimental Potato Trials ...	8
Manure Trials with Potatoes	**474, 540**
Romsey Potato Competition ...	314
Rams—Purchase of	259
Ration, Balanced	522
Ration, Finding Nutritive Ratio	533
Read, F. M. (and Strickland, A. G.)—	
Manurial Experiments on Apple Trees	735
Red Spider	603
Root Borer	548, 733
Rotation Crop Trials	709
Rugg, W. C.—	
Breeding of Poultry	411
Disposing of Eggs	664
Hints for the Poultry Farmer	465
Poultry on Dairy Farms ...	107
Winter Egg-laying Test, 1928	566
Rugg, W. C. (and Clinton, H. F.)—	
Burnley Egg-laying Competition, 1927-28—Report on ...	321
Rupanyup Crop Competition ...	288
Rutherglen Bug	733
Rutherglen Crop Competition ...	153
Rutherglen Field Day	705

Page

Ryan, P.—
- Boort Crop and Fallow Competition 30
- Caniambo Crop Competition, 1928 722
- Making of Stock Silage ... 234
- Maize Experiments at Orbost 605
- Quambatook Crop, &c., Competition 33
- Sea Lake Crop and Fallow Competition 724
- Willaura Crop Competition ... 222

Rye—Value of as Stock Food ... 526
Salads—Making of ... 241, 693
Salsafy 26
Sea Lake Crop, &c., Competition 724
Separator—Necessity for Cleanliness 132
Sheep—
- Care at Lambing-time ... 392
- Clubs in Canada 315
- Crutching 392
- Feeding Ewes 394
- Hand-feeding ... 259, 394
- Mating of 260

Sheep Deep—Plans of 245
Silage, Stack—Making of ... 234
Silage, Crops for 529
Silverfish 456
Soil and Crops 388
Soil Fertility 641
Sorghum—Value of as Stock Food 529
Stallions—
- Parade for 1928 ... 301, 437
- Register, 1928-29—
  - Part 1 498
  - Part 2 620
  - Part 3 696
- Registration of—Annual Report 298
- Regulations under Horse-breeding Acts 305

Standard Herd Test—
- Report for December, 1927, Quarter 174
- Report for March, 1928, Quarter 366
- Report for Year 1927-28 ... 513
- Report for September, 1928, Quarter 743

Stock—
- Balanced Ration for ... 522
- Feeding 472, 513, 515

Stock Foods—Value of—
- Barley 526
- Bran 525
- Branning 528
- Brewers' Grains 527
- Clover (Red) 530
- Coconut Oil Cake 528
- Cottonseed Meal 527
- Hays (Various) 531
- Linseed Meal 527

Page

Stock Foods—Value of—*contd.*
- Maize 525, 529
- Maize Oil Meal 525
- Mangolds 528
- Molasses 528
- Oats, Gristed 525
- Pea Meal 527
- Pollard 525
- Pollymeal 525
- Potatoes 528
- Rye 526
- Sorghum 529
- Sugar Beet 528
- Sugar Beet Pulp 528

Strickland, A. G. (and Read, F. M.)—
- Manurial Experiments on Apple Trees 735
- Sugar Beet—Value of as Stock Feed 528
- Sugar Beet Pulp—Value of as Stock Feed 528
- Superphosphate—
  - Helps to Combat Weeds ... 400
  - Value as a Fertilizer 397, 489
- Sydenham Wheat Crop Competition 28
- Sydenham Fallow Competition 285

Talbot, R. J. de C.—
- Parasites in Pigs 406

Thomas, R. G. (and Twentyman, R. L.)—
- North-Eastern Mallee Crop Competition 197
- North-Eastern Mallee Fallow Competition 227

Tindale, G. B.—
- Colouring Valencia Late Oranges by Ethylene Gas ... 41

Tobacco Leaf—Curing of ... 187
Tomato Seed—Cleaning of ... 236
Twentyman, R. L.—
- Sydenham Wheat Crop Competition 28

Twentyman, R. L. (and Thomas R. G.)—
- North-Eastern Mallee Crop Competition 197
- North-Eastern Mallee Fallow Competition 227

Vasey, A. J.—
- Nhill Crop, &c., Competition 138
- Numurkah Fallow Competition 283
- Yarrawonga Crop, &c., Competition 91

Vegetable Preservation ... 617
Vines. (*See* Viticulture.)
Viticulture—
- Cultivation of Vines ... 73
- Downy Mildew 662
- Grape Shipments to —
  - London 15
  - New York 21
  - Vancouver 21

Page

Viticulture—*continued.*
Packing Experiments ... 22
Planting and Reconstruction of Vineyards 313
Seasonal Hints 661
Sulphuring 663
Vineyard Tillage 72
Wangaratta Crop, &c., Competition 156
Wangaratta Fallow Competition 361
Ward, J. M.—
Review of 1928 Fruit Season ... 421
Some Problems in Horticulture Needing Investigation ... 1
Warracknabeal Crop, &c., Competition 206
Warragul Potato Trials ... 481
Weeds—
Prickly Pear—A Hardy Specimen 635
Salsafy (*Tragopogon porrifolius*) 26
Superphosphate Helps to Combat 400
Western Mallee Crop, &c., Competition 206
Wheat—
Cultivation Tests 713
Experiments at—
Carwarp 277, 675
Longerenong College ... 38
Mallee 167
Numurkah 168
Rutherglen 708
Salisbury 274
Shepparton 281
Walpeup 167
Western Wimmera ... 272
Willaura 272
Fallowing—Value of ... 207
F.A.O. Sample—Analysis of ... 249
Flag Smut 725
Gypsum Trials 275

Page

Wheat—*continued.*
Manurial Trials—
Carwarp 277, 673
Gypsum Trials at Salisbury 275
Numurkah 168
Rutherglen 712
Salisbury 275
Shepparton 281
Walpeup 167
Willaura 272
Manuring—Value of 207
Pickling Tests 714
Replicated Plots 277
Sowing the 1928 Crop ... 168
Take-all 153
Technique in Field Trials ... 65
Varieties—Average Results at Willaura 223
Varieties Suited for Different Districts 165
Variety Trials—
Carwarp 277, 673
Numurkah 168
Rutherglen 707
Shepparton 281
Walpeup 167
World Situation 763
Wheatsheaf Potato Trials ... 484
White Ants 453
Whitewash for Farms 483
Willaura Crop Competition ... 223
Wimmera Cultural Methods ... 38
Wine—
Madeira 577
Wohlers, C. P.—
Bannerton Fallow Competition 225
Wool Classing—Book on ... 360
Wool Industry—South Africa ... 739
Woolly Aphis 232
Yarrawonga Crop, &c., Competition 91
Yuill, W. J.—
Dollar District Calf Club Competition, 1927 134
Lessons from Herd Testing Work 476

By Authority: H. J. Green, Government Printer, Melbourne.

THE JOURNAL

OF

THE DEPARTMENT OF AGRICULTURE,

VICTORIA, AUSTRALIA.

CONTENTS.—JANUARY, 1928.

		PAGE
Some Problems in Horticulture Needing Investigation ...	*J. M. Ward*	1
Experimental Potato Trials—Millbrook, 1926-27	*J. T. Ramsay*	8
Fresh Grape Shipments	*F. de Castella*	15
A Harmful Weed—Salsafy (*Tragopogon porrifolius* L.) ...	*P. F. Morris*	26
Sydenham Wheat Crop Competition ...	*R. L. Twentyman, B.Agr.Sc.*	28
Boort Crop and Fallow Competition, 1927	*P. Ryan, B.Agr.Sc.*	30
Quambatook Crop and Fallow Competition, 1927 ...	*P. Ryan, B.Agr.Sc.*	33
Kerang Crop Competition, 1927	*J. E. Harrison, B.Agr.Sc.*	36
Wimmera Cultural Methods		38
Valencia Late Oranges—Colouring by Ethylene Gas	*G. B. Tindale, B.Agr.Sc.*	41
Artificial Fertilizers Registered for 1928		42
Improvement of Scottish Pig Industry		57
Orchard and Garden Notes		60
Reminders for February		62

COPYRIGHT PROVISIONS AND SUBSCRIPTION RATES.

The Articles in the Journal of the Department of Agriculture of Victoria are protected by the provisions of the Copyright Act. Proprietors of newspapers wishing to republish any matter are at liberty to do so, *provided the Journal and author are both acknowledged.*

The Journal is issued monthly. The subscription, which is payable in advance and includes postage, is 3s. per annum for the Commonwealth and New Zealand, and 5s. for the United Kingdom and Foreign Countries. Single copy, Threepence.

Subscriptions should be forwarded to the Director of Agriculture, Melbourne. A complete list of the various publications issued by the Department of Agriculture will be supplied by the latter.

W&W 1052

Cyclone

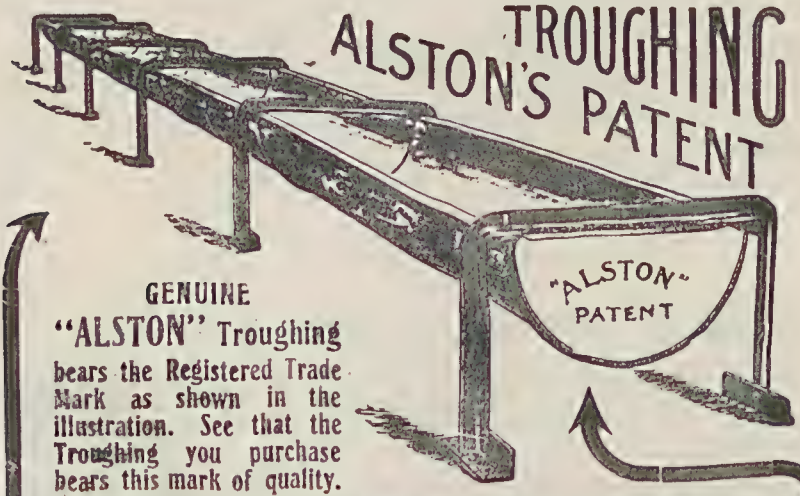
METAL GATES AND FENCES

The Original Make — Cyclone Red Tag Quality Fences & Products — Dependable and Durable

Cyclone Ornamental Fabric Fencing is practically everlasting. The crimped wire pickets of No. 8 gauge are heavily galvanised, and never require painting. Cyclone Metal Gates can be had to match the fence. Cyclone Catalogues will be posted free on request.

CYCLONE FENCE AND GATE CO. PTY. LTD.

189-191 WILLIAM STREET, MELBOURNE ——— 'Phones: Central 820, 3228



ALSTON'S PATENT TROUGHING

GENUINE "ALSTON" Troughing bears the Registered Trade Mark as shown in the illustration. See that the Troughing you purchase bears this mark of quality.

Steel throughout. Put together with a wrench, no solder required. Cannot leak or pull apart because the Alston Patent Coupling makes a perfectly watertight joint without grooves to fracture the galvanising, while locking every section together as rigidly as a bridge.

The heavy Steel Angle Frame and heavily Galvanised Steel Sheets used, together with our Patent Coupling are points which make the ALSTON TROUGHING superior to all others.

Send for Illustrated Leaflet.

JAMES ALSTON & SONS PTY. LTD., Queens Bridge, Melbourne.

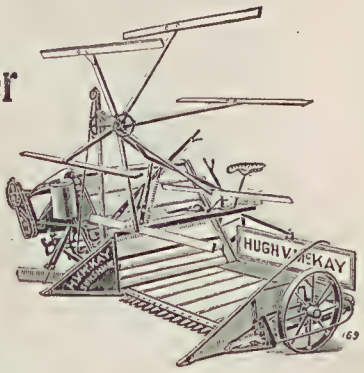
Postal District 6.

Good Crops
demand
Good Machines

THE
Sunshine Reaper & Binder

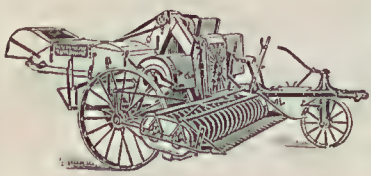
6 ft., also 8 ft. cut.

The machine which is built locally to suit Australian conditions. It is famous for its durability. It is the lightest draught machine; cuts low and clean; ties every bundle tight; and may, with confidence, be used in the heaviest crop of hay grown.



THE
Sunshine Header Harvester

6 ft., 8 ft., and 10 ft. cut



has the esteem of the grain grower because it has rescued hundreds of thousands of bushels of wheat from crops so tangled and fallen as to be a total loss without the help of this machine. It is equally efficient in oats and barley, and, with special treatment, harvests peas or rice at a fractional cost as compared with old methods.

Above machines are pulled by a team or a tractor, but the SUNSHINE AUTO-HEADER, 12 ft. cut, is a complete self-propelled machine, especially suitable for large area operations

Ask for Catalogues and Price List of all Sunshine Implements
SENT POST FREE ON REQUEST

H. V. McKAY PTY. LTD.
Sunshine Harvester Works, Sunshine

Showrooms - - - 664 Bourke Street West, MELBOURNE

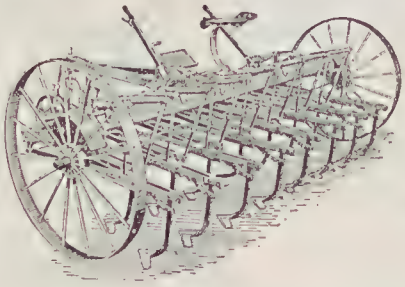
MASSEY-HARRIS

No. 15 STIFF-TOOTH CULTIVATOR

WITH FAMOUS POWER LIFT

□

POSITIVE AND QUICK ACTION



Syphon Oiler for Axles.

Oscillating Forecarriage.

Wide Range of Points.

Each tooth has a safety trip spring.

The Massey-Harris No. 15 Stiff-Tooth Cultivator is the ideal Implement for working up Fallow, and is also a great Weed Killer.

Here are a few of its Main Features:

Strong and Heavy Frame.—Sturdy and rigid, giving it powerful resistance to strains, and a tremendous capacity for hard and heavy work.

Pressure Applied through Lift.—The pressure is applied through the lift, and is regulated by convenient lever. Adjustable pressure provides for deep or shallow cultivation.

Sure Acting, Two-Wheel Driven Power Lift.—Quick and positive in action, raising and lowering the teeth in a few seconds.

SIZES: 8 feet—11 teeth; 11 feet—15 teeth. Power or Hand Lift. Tractor Hitch if desired.

Catalogue, also Prices and Terms, from our Local Agent, or write

Massey-Harris Co. Ltd., Melbourne

Branches: Sydney, Adelaide, Brisbane, Perth, Christchurch, N.Z.

LYSAGHT'S

ORB

CORRUGATED ROOFING IRON

Full supplies throughout Australia are obtainable from all leading Storekeepers and Timber Merchants

The "Banyule" Jersey Stud

HEIDELBERG, VICTORIA ——— **8 miles from G.P.O.**

ALL GOVERNMENT TESTED

YOUNG STOCK FOR SALE

Inspection and Correspondence Welcomed. C. GORDON LYON

WHEAT-GROWERS!

NOW is the time to order your

Sickle Brand

Copper Carbonate

FOR

"Dry-Pickling" Seed Wheat against Smut or Bunt

Have it in readiness to do the work while farming operations are slack.

The seed is not injured by Dry-Pickling in advance.

Reduced Price

1/8 PER POUND

In 6-lb. triple (wax-lined) packets or in 24-lb. tins

(Same price per pound either size)

Handy 2-oz. measures packed with order free, or mailed on request to the manufacturers—

Cuming, Smith & Co.
Pty. Ltd.

65 WILLIAM STREET — MELBOURNE

LILYDALE LIME For the LAND

Farmers who have not used **Burnt Lime** should try it. The action of Burnt Lime on the land is **Immediate.** Farmers have the opportunity of obtaining the **well-known Lilydale Agricultural Lime.**

ANALYSIS—98% Calcium Oxide.

Apply—
DAVID MITCHELL ESTATE,
Sole Proprietors.

Head Office:
OLIVER'S LANE, MELBOURNE
Tel. Central 5725 and 5726.

This Journal

offers exceptional advantages

for Advertising

Circulates throughout the **Country Districts** of **Victoria** and amongst **Farmers** of the **Commonwealth,** reaching also country professional men, tradesmen, schoolmasters, teachers, and the like.

Exceptionally satisfactory results have followed the advertising of Stud Stock in this Journal.

Rates on application to the Official Canvasser

Mrs. Hemming, "Cobham," 1 Ruskin Street, St. Kilda

A GOOD FENCE REQUIRES GOOD NETTING

THE
Farmers & Settlers' Co-Operative Insurance Co.
OF AUSTRALIA LIMITED

Farmers and Graziers, Support this Company with all your Insurances, when Dividends and Bonuses to yourselves will be increased considerably.

Full Particulars from any Agency of the Victorian Producers' Company,
OR
360 COLLINS STREET, MELBOURNE

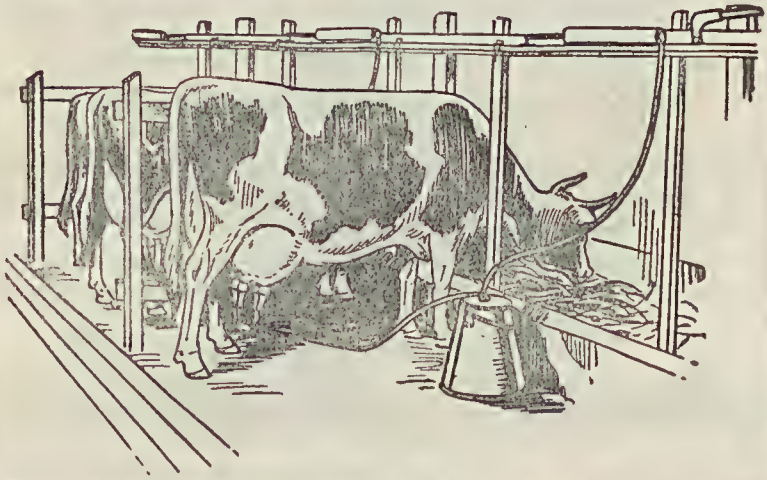
SCIENTIFICALLY FITTED GLASSES ENSURE COMFORT

IF you are in doubt as to whether you require glasses or not you should have your eyes tested by an expert. The Optical Service our Clients enjoy ensures comfort in wearing glasses that fit accurately.

'Phone 6778 for an appointment

E. WOOD PTY. LTD. 95 ELIZABETH STREET — MELBOURNE —
OPHTHALMIC OPTICIANS
Stevenson

Emu Milking Machine



It's Simpler, Safer, Better and only Half the Price

Old Style Milker, 4 units, about	£223 0 0
EMU Milker, 4 units, (Engine and all Fittings)	£111 10 0
Difference	£111 10 0

THE EMU Bucket System Milker keeps a daily check on every cow in the herd and the extra bucket supplied free makes work easy for youngsters. The EMU Bucket System is more sanitary and the milk of the lowest bacterial count insuring highest returns. Takes but a fraction of the usual time to clean; easier on the cow, cleaner than hand milking, and increases production. Every plant guaranteed. Hundreds in use.

Write for all information — no obligation.

T. ROBINSON & COMPANY Pty. Ltd.

SPOTSWOOD, VIC. Showrooms: 536-538 Bourke St., Melbourne

'PHONE 7419 CENTRAL

.. THE ..

Australasian Mutual Insurance Society

LIMITED

(Now Incorporated in the Australian Alliance Assurance Company.)

400-2 COLLINS STREET, MELBOURNE

LIVE STOCK INSURED

At Lowest Current Rates obtainable in Australia.

OTHER DEPARTMENTS OF BUSINESS

Fire, Marine, Fidelity Guarantee, Plate Glass, Personal Accident and Sickness, Employers' Liability, Workmen's Compensation, Public Risk, Motor Car, and Burglary.

INSURE WITH THIS SOCIETY, AND RECOMMEND IT TO YOUR NEIGHBOURS

Australian "ESA" Bluestone

APPROXIMATE ANALYSIS 99·15% COPPER SULPHATE.

FOR SPRAYING, PICKLING, BATTERY PURPOSES, ETC.

If your Storekeeper has no Stocks, Send your Inquiries to:—

ELDER, SMITH & CO., LIMITED, SOLE AGENTS

ADELAIDE: 27-31 Currie Street.
MELBOURNE: 95-97 William Street.
SYDNEY: 4 Bridge Street.
BRISBANE: 334-338 Queen Street.
PERTH: St. George's Terrace.

WRITE FOR DESCRIPTIVE PAMPHLET

DEPARTMENT OF AGRICULTURE, VICTORIA

NOW AVAILABLE

Handbook of Potato Diseases in Australia—and their Treatment

BY D. McALPINE,
GOVERNMENT VEGETABLE PATHOLOGIST

With Appendices by W. Laidlaw, B.Sc. (Biologist), on **Eel Worms**; and C. French, Jnr. (Government Entomologist), on **Insect Pests of the Potato.**

235 Pages (Cloth). 176 Illustrations. 58 Full Plates. **Price, 5/-** Postage: Commonwealth, 2d.; New Zealand, 8d.; British and Foreign, 1/4.

Applications accompanied by Postal Note or Cheque, covering Price and Postage, to be forwarded to **The Director of Agriculture, Melbourne, Victoria.** Remittances from beyond the Commonwealth to be made by Post Office Order.

Steadily and Surely

SULPHATE OF AMMONIA is finding increased favour with the farmers and orchardists of the State. Particularly is this so where small acreages and high production costs necessitate large acre yields. *In*tensive cultivation will succeed where *ex*tensive cultivation has proved unprofitable. It is just as true to-day as it was when nitrogenous fertilizers were first applied in the State that

Crops are bigger and better when you use

SULPHATE OF AMMONIA

Write for Handbook, "Productive Fertilizers"

THE METROPOLITAN GAS CO.

196 FLINDERS STREET, MELBOURNE

NATIONAL TRUSTEES

Executors & Agency Company of Australasia Ltd.

DIRECTORS:

EDWARD FITZGERALD, ESQ., LL.D., Chairman.
HENRY MADDEN, ESQ. SENATOR MAJOR-GENERAL H. E. ELLIOTT, C.B., C.M.G., D.S.O., D.C.M.
JOHN I. WINTER-IRVING, ESQ. CHAS. R. MURPHY, ESQ.
JOHN S. FEEHAN, ESQ.

This Company Acts as Executor or Joint Executor of Wills, Administrator, Trustee of Settlements, and Agent for Absentees under Power of Attorney.

MONEY TO LEND ON BROAD ACRES AND FARM LANDS

Offices—113 Queen St. (Corner of Little Collins St.), Melbourne

CHAS. CROMIE, Manager.

is a simple arrangement that multiplies the power at the handle 260 times—handy to use, easy to move, quickly rigged, and works in roughest country. Standard equipment pulls trees and stumps from 1¼ acres without changing anchor. Many other time and labour saving features. Catalogue with pleasure.

TREWHELLA BROS. Pty. Ltd., TRENTHAM

DEPARTMENT OF AGRICULTURE

POULTRY FOR SETTLERS

Orders for Cockerels for delivery from March may now be booked from the Poultry Pens at the Central Research Farm, Werribee
Settings of Eggs can be supplied in season
1st July to 1st October orders are booked in rotation

WHITE LEGHORNS

No. 1—Pure Cosh World's Record Strain.

„ 2—From Single Tested Hens with scores of 260 to 285 eggs, Single Mated to Cocks bred from Hens with scores of 275 to 301 eggs.

UTILITY BLACK ORPINGTONS

(Founded on Christie and Cullen Strains)

No. 1—From Single Tested Hens with scores of 256 to 284 mated to Cockerels bred from Hens with scores of 272 to 313 eggs.

„ 2—From Hens bred from above mated to Cockerels bred from Single Matings.

RHODE ISLAND REDS

Pure Dalrymple

From Hens with scores of 250 to 275 eggs, mated to Cockerels bred from Hens with scores of 264 to 292 eggs in 12 months.

For prices and particulars apply to The Manager, Research Farm, Werribee

YOUR Tractor is an Asset

Reduce operating costs and depreciation to a minimum by using

Neptune Power Kerosene

and

Neptune Super Refined Tractor Oil

Obtainable in Drums or 4-Gallon Tins from all Country Depots or direct from

NEPTUNE OIL COY. LTD.

RICHMOND, VICTORIA

Also Sydney, Brisbane, Adelaide, Fremantle, Hobart & Launceston

REDUCED PRICES
FOR
COPPER CARBONATE
(Anti-Bunt, 95/100 per cent. purity)

Cuts down Waste Cuts down Labour Cuts down Cost

Secure one of our PAMPHLETS wherein we have given:—

The Reasons why the largest wheat-growing Countries in the World have adopted the Process of Pickling Seed Grain with Dry Copper Carbonate.

The many advantages Anti-Bunt (Copper Carbonate) has over all other methods.

Guaranteed Analysis and Fineness.

PRICES—Season 1928 { Kegs, 56 lbs. .. .. 1/7 lb. { ½-ton lots or over—less 10% f.o.r. or f.o.b. Melbourne.
Cases, 2 x 20-lb. tins .. .. 1/8 lb.
,, 4 x 10-lb. tins .. ..
,, 8 x 5-lb tins .. }

ALSO MANUFACTURERS OF— { "Vallo" Powder Sheep Dip, "Vallo" Fluid Sheep Dip, "Derval" Non-Poisonous Paste Sheep Dip } "Vigoreen" for Sheep, Dairy "Vigoreen", Pig "Vigoreen"

Agents for "CYANOGAS" throughout Victoria.

Manufacturers—

A. VICTOR LEGGO & CO. - 218-222 Queen St., Melbourne

Branches: Sydney and Brisbane

Secure your supplies early. Obtainable all Stores, Agents, &c.

New Zealand Loan & Mercantile Agency Co. Ltd.

COLLINS STREET, MELBOURNE

LIBERAL CASH ADVANCES

WOOL, GRAIN, SKINS, HIDES, TALLOW, BARK, STOCK AND STATION AGENTS ON COMMISSION ONLY

LOCAL SALES AND SHIPMENTS OF BUTTER UNDERTAKEN ON OWNER'S ACCOUNT

Agents for

PAGE'S WIRE STRAINERS IRONSIDE WIRE CUTTERS
BAILEY'S ANTI-MAMMITIS LOTION
FATERINE, A NATURAL CALF AND PIG FOOD

COOPER'S SHEEP DIP

COOPER'S MILK OIL FLUID COOPER'S WORM TABLETS
WEEDICIDE MEDICO COOPER'S LAVENE

SALES OF SHEEP & CATTLE

Held Weekly at Newmarket

Fordson Cuts Production Costs

EVERY farmer knows the value of work done on time. Urgent work is often delayed by unfavorable weather. This proves costly when crops are planted late in a poorly prepared seed bed.

With a Fordson, you can get your ploughing done and your crop planted on time—every moment of favorable weather counts, and a greater amount of work is accomplished by its speed and abi ity to work tirelessly and unceasingly. The result is a good seed bed made on time. Fordson farming is more profitable because you can dispose of six to eight horses and keep productive live stock instead.

Mr. A. W. Major, of Iraak, via Carwarp, Victoria, sends us the following report ot Fordson operations, and states that cost of repairs for two years did not exceed £5—convincing proof of Fordson economy.

Ploughing—5-furrow plough, 10 acres per day; consumption, 1¼ gallons kerosene per acre.

Drilling—33 tyne, 16 row, 9½ ft. Combine Drill and Cultivator, 22 acres per day; fuel consumption, ⅜ths gallon per acre.

Pumping—6" Centrifugal Pump; fuel consumption, ½ gallon per hour.

Chaffcutting—9½" Mouth Chaffcutter; consumption, ½ gallon per ton. Power kerosene was used throughout.

Ask your nearest Ford Dealer for a demonstration of Ford products on your own property.

Ford

ONE-TON TRUCK

Complete with Standard Body. F.O.B. Ford Works in this State .. £160

Fordson

The UNIVERSAL TRACTOR

Complete with Fenders and Pulley; F.O.B. Ford Works this State £180

FORD MOTOR COMPANY OF AUSTRALIA PTY. LTD.

Branches in all States

The Best
IS
The Cheapest.

LYSAGHT'S AUSTRALIAN MADE

WIRE NETTING, FENCING AND OTHER WIRES, ZINC OXIDE

are known as the Very Best throughout Australia

Obtainable from all Leading Merchants and Storekeepers

LYSAGHT BROS. & CO. LTD.

Head Office—39 Pitt Street, SYDNEY
Works—Parramatta River

Agents for Victoria
GIBBS, BRIGHT & CO.

COCKBILL'S
BONE MEAL for FEEDING
CATTLE, PIGS, and all FARM STOCK

IS A SOURCE OF LIME, PHOSPHATES, AND PROTEIN.

Most Fodders are deficient in mineral matter—
BONE MEAL will provide the necessary mineral matter.

COCKBILL'S BONE MEAL is manufactured from clean, fresh bones, steamed and sterilized at a high temperature and pressure, and finely ground to ensure easy digestion.

Price, 16s. per cwt.

Sample on request to J. COCKBILL, 407 POST OFFICE PLACE, MELBOURNE.

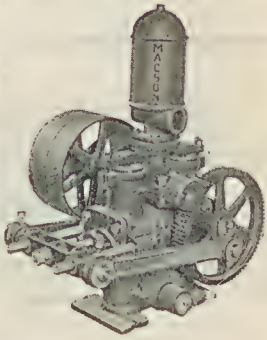
The "Fulham Park" Ayrshire Stud
ROCKBANK, VICTORIA (20 MILES FROM G.P.O.)
Topped Ayrshire Herd, 1927
All Government Tested YOUNG BULLS FOR SALE

The "Fulham Park" Stud of Peerless Black Leghorns
The best (by test) this side of the Line.
EGGS AND STOCK FOR SALE

Inspection and correspondence welcomed. J. COCKBILL, 407 P.O. Place, Melbourne, Victoria.

Profitable Pumps

Because they're Lifetime Pumps



All over Australia there are "Macson" Pumps working as steadily and as efficiently now as they did when purchased years ago. There are definite reasons why "Macson" Pumps are noted for their long service.

Here are three—

1. Gear and pinion teeth are machine cut, thus ensuring quiet operation and long life.
2. The cylinder head and casing are cast in one piece, giving a remarkably rigid construction, and removing all possibility of leaking or blowing out of packing at this point.
3. The "Macson" heavy brass cylinder liner is considerably thicker than that of any pump of a similar type. This means much to those who are in the country, as replacing liners is a costly and difficult job, and may even mean sending the pump to the city for repairs. The heavy "Macson" liner NEVER needs replacing.

Such sturdiness and strength mean that your initial outlay is your last with a "MACSON" Pump. The "Macson" is an ideal outfit where pumping of almost any kind is desired and for general water supply, tank pumping for farms, irrigation, light oils, and spraying.

WRITE FOR FURTHER PARTICULARS NOW

McPherson's Proprietary Limited

582 Collins Street
MELBOURNE

PARSONS BROS. & CO.

Propy. Ltd.

ARE

Buyers of Oats, Peas, Barley, and Maize

SEND SAMPLES OF YOUR GRAIN TO US

BOX 2514,
G.P.O., MELBOURNE

REGISTERED TRADE MARK

Works—
CURDIE'S RIVER

Telephone—Central 2807

"BULLDOG" Unburnt (Ground Carbonate) Agricultural Lime

For Orchards, Crops, and Pastures

Its use is strongly recommended by all experts, and those who have had practical experience. Any quantity supplied at shortest notice.

For applying to land we recommend our "Ajax" Lime Spreader

Have you seen our Reinforced Cement Cattle and Pig Troughs?

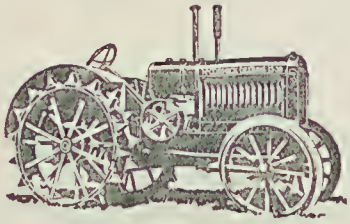
Rates and full particulars from Distributors—

T. CURPHEY Pty. Ltd. 225 Coppin St. Richmond, Victoria

"Good equipment makes a good farmer better"

McCORMICK-DEERING FARM MACHINES

THE McCormick-Deering line of farm machines includes machines for every farm operation. Faithfully constructed, well designed, efficient, and dependable, McCormick-Deering Farm Machines are especially suitable for Australian conditions and can be relied upon to give service and satisfaction at all times—wherever they are used.

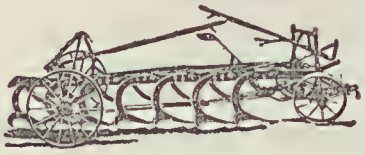


TRACTORS

McCormick-Deering Tractors are furnished in 10-20 and 15-30 sizes. Fitted with removable cylinders, ball and roller bearings at 28 points, one-piece main frame, belt pulley, throttle governor, automatic oiling system, high tension magneto, platform, mud-guards, &c.

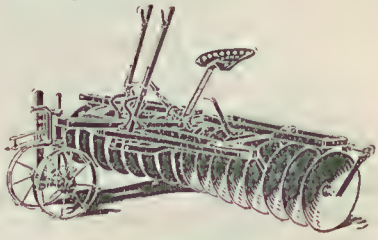
CULTIVATOR-DRILLS

The McCormick-Deering Cultivator-Drill is an invaluable time and labour saver. Cultivates and drills at the same time or separately as required. Built in various sizes with spring or rigid tines. Can be used with horse or tractor power.



PLOWS

Single or multi-furrow. Disc or mouldboard. Stump-jump or set. Whatever size or type of farm, orchard, or vineyard plow you require, you will find it in the McCormick-Deering line. Special types for tractor work.



HARROWS

The McCormick-Deering line includes disc harrows, spring-tooth harrows, and peg-tooth harrows in horse and tractor styles. Special types for orchard work, cotton and sugar plantation, &c.

INTERNATIONAL HARVESTER COMPANY OF AUSTRALIA PTY. LTD.

278-94 ROMA ST. BRISBANE — 229-31 CASTLEREAGH ST. SYDNEY — 543-55 BOURKE ST. MELBOURNE — 113-4 N. TERRACE ADELAIDE

RICHARD PURSER & CO., BASSENDEAN, AGENTS FOR W.A.
ROBT. NETTLEFOLD PTY. LTD., HOBART, AGENTS FOR TAS.

THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XXVI. **January, 1928.** **Part 1.**

SOME PROBLEMS IN HORTICULTURE NEEDING INVESTIGATION.*

By J. M. Ward, Superintendent of Horticulture.

Although the area under fruit in Australia is some 273,845 acres, and the annual value of the produce approximately £18,000,000, very little scientific investigation into the problems facing fruit-growers has been made. Hence my reason for bringing this subject under notice.

Of the horticultural problems now confronting us, the following need early attention:—

1. Fruit tree stocks.
2. Manuring of fruit trees.
3. Quality and greater tree production of canning fruits.
4. Productivity of individual trees.
5. Pollination.
6. Water requirements of fruits grown under irrigation.

Fruit Tree Stocks.

Most varieties of tree fruits have from very early times been worked on to root systems other than their own. Vergil emphasized the importance of choosing a suitable stock, and many writers since his time have dwelt on the influence which the stock undoubtedly exerts over the scion; and yet to-day we are still appallingly ignorant on the question.

The position is that each type of fruit is grown on a variety of stocks; and though certain prejudices exist in favour of, or against particular stocks, their fundamental characteristics are still a matter of conjecture or opinion only.

Then, again, it is evident that among stocks enjoying one commercial name great variations occur, and it is highly desirable that selections

* Paper read at the Congress of the Australasian Association for the Advancement of Science, Hobart, January, 1928.

of the best should be made, so as to reduce the great variation existing from tree to tree in most of our orchards.

We know that so far as apple tree stocks are concerned, the great majority of apple trees planted in the mainland States are on Northern Spy stock, which has been vegetatively propagated, whereas in Tasmania the majority of the apple trees are worked on seedling or "free" stocks.

Neither of these stocks is giving complete satisfaction. At the same time, most mainland growers and almost the whole of the fruit-tree nurserymen are satisfied with the stock used by the majority of nurserymen, i.e., the Northern Spy variety.

The Scarlet Nonpariel apple (known as Scarlet Pearmain in Tasmania) appears to be a complete failure when worked upon the vegetatively-raised Spy stock; the same thing applies to a lesser extent to Cleopatra and Sturmer Pippin, whereas these varieties, more especially Scarlet Nonpariel, have done very well upon the "free" stocks.

Although I have stated that a large number of growers and nurserymen appear to be satisfied with the Northern Spy stock, they have really not given the matter serious consideration, particularly in so far as the use of certain stocks for the various kinds of apples, and the adaptability of stocks for different soil and climatic conditions are concerned.

Excellent work has been done, and is being continued, in connexion with apple tree stocks at East Malling Research Station, Kent, England. Similar work for our conditions is needed in Australia.

For some time past, pear-growers of Australia have had considerable trouble with pear aphis (*Eriosoma pyricola*), which attacks the roots of pear trees, and nurserymen are having great difficulty in finding suitable stocks resistant to the attacks of this insect, and yet suitable in other respects. The pear variety, *Pyrus Calleryana*, appears to be highly resistant to the pest in question, and promises to be a good stock for pears generally. In writing upon pear stocks (Bulletin No. 214, "Blight Resistance in Pears and Characteristics of Pear Species and Stocks"), Professor F. C. Reimer, of Oregon Agricultural College, Oregon, states in regard to this variety:—

> "*Resistance to Woolly Aphis.*—One of the most important characteristics of *P. calleryana* is its high degree of resistance to the Pear Woolly Aphis. This insect is a serious pest on French pear stocks on the Pacific coast. Among the many seedlings of the French pear stock of various ages at this station it is difficult, during the later summer and early fall, to find any which are free from this aphis. Very often the French roots are literally covered with white masses of it. Under identical conditions, and often in adjoining rows, the roots of *P. calleryana* seedlings are entirely free from this insect. In thousands of seedlings which have been dug at this station these aphids are rarely found on *P. calleryana*, and in no case has there been a sufficient number on the roots to produce the slightest injury. In this respect *P. calleryana* appears to be superior to all other species in our collection."

In order to deal with the pear root aphis in Victoria, investigation into pear stocks is necessary. At the same time consideration should be given to the use of stocks resistant to the pear blight (*Bacillus amylovorous*), and in this respect we could profit by the valuable work done by Reimer.

Investigations are also urgently needed in connexion with stocks for stone and citrus fruits. In the Goulburn Valley, Victoria, for instance, some of the largest and most successful growers of peaches and apricots are of the considered opinion that the average commercial life of peach and apricot orchards, growing under irrigation, is only ten bearing years. If this is borne out by actural fact—and there is no reason to doubt the statements of the growers in question—the difficulty may be overcome by the use of some other stock or stocks than those now in use. The Victorian Department of Agriculture, through its viticulturist (Mr. F. de Castella), has done some excellent work on the subject of the affinity of vine stocks and scions, the results of which will shortly be published; similar good work on fruit tree stocks is long overdue, and further delay in commencing this very necessary work should not be tolerated.

Manuring of Fruit Trees.

The subject of manuring of fruit trees has been sadly neglected in Australia in so far as scientific investigation is concerned. Here is a wonderful field for the employment of scientific workers.

In attempting a solution of this most difficult of problems, it must first of all be admitted that, in the past, field trials have been very disappointing. They have not only failed to show definitely the beneficial effects of the many fertilizers, but have also frequently given contradictory results. This may be because the correct basis for securing field results has not been formulated. It has, it seems, been the practice in almost every case to express the results on each plot in terms of the yield of fruit. This is not sufficient, because it does not indicate the nature of the growth of trees thoughout the year. For instance, if a manure hastens the blossoming of a tree so that it catches a frost while blossoming, the yield of that tree may be reduced, as compared with an unmanured tree. Had there been no frost, a very different result may have been obtained. Suppose the yield of fruit only had been observed and no note taken of the daily changes in the trees throughout the year. In such a case our conclusions would be entirely wrong. We would broadly state that the fertilizer in question was of no value for, say, apples, whereas it may have been of great benefit to the later blossoming varieties.

This is true, probably, of all field trials at the present time, and is mentioned to show why it would be unwise to pin our faith entirely to field experiments.

The object of field trials, it is considered, should be to test out the principles evolved by laboratory experiment. This is the practice adopted at the famous Long Ashton Research Station, which is connected with the Bristol University.

At the same time it may be of great value in the future to have blocks of trees which have been for many years manured in the same way each year. The cumulative effects of many years' treatment will then be seen, and our methods of determining their value will have advanced also.

It is of extreme importance to find out just at what time of the year the tree absorbs its minerals. Research in the case of field crops and vines has shown that the plant secures practically its whole year's

mineral requirements in the first few weeks of its renewed activity in the autumn or spring respectively. If this is so for fruit trees, then it is imperative to find it out; and so eliminate the waste of manures which must occur if quickly acting or soluble compounds are added to the soil after the period in which the trees are able to benefit from them. A properly equipped glass-house and plant-house for this plant culture work is necessary, together with a suitable small laboratory in which chemical and microscopical studies will be possible.

Quality and Greater Tree Production of Canning Fruits.

In this respect, I desire to confine myself to two fruits, viz., peaches and apricots.

PEACHES.

As is well known, the peach most commonly produced in Australia for canning purposes is "Pullar's," a variety raised in the Goulburn Valley. It has become popular on account of its being a "bread-winner"; or, in other words, a reliable cropper. It is a late variety, and is canned during the latter part of March and in April. Whilst it is an excellent canner, it has a very large stone; it also lacks the deep golden colour that the public likes in a canned peach. An attempt should be made to evolve a peach similar in flesh to Pullar's but with a small stone, by crossing Pullar's with a small-stoned variety; at the same time an attempt should be made to eliminate the red flesh round the stone.

The result of such a cross, according to the Mendelian theory, will be as follows:—In the first generation dominant characters will prevail, and if the small stone be dominant, then the crossbred will possess a small stone; if good flesh be also dominant, the result will possibly be the new peach we are now seeking.

Another matter to be considered is the production of several canning varieties that will mature at intervals, and thus prolong the canning season.

At the present time, there is a slack season of some three weeks between the treatment of the last apricots and the first peaches, and it is to provide fruit during this interval that it is desirable to raise either a later-maturing apricot or an early-maturing peach suitable for canning.

We have a number of really good mid-season peaches so far as the quality of the fruit is concerned. I refer to such varieties as Golden Queen, Levis Cling, Nicholl's Cling, Lemon Cling, Orange Cling, and Sim's. Unfortunately, none of these varieties produces a sufficient crop to make them a payable proposition, and therefore growers prefer to grow Pullar's. However, the general production of this variety is not satisfactory to the canneries, as they require a continuous supply of fruit throughout a longer season, rather than a heavy supply of one variety over a short season.

Investigation is required with a view to either breeding suitable mid-season varieties that will produce heavy crops, or discovering the cause of the comparatively low yield of the kinds referred to. In some instances there is a decided "drop" of flower buds during late winter, which is responsible for low yields. The cause of this "drop" requires investigating.

APRICOTS.

The principal variety of apricot produced in the Goulburn Valley is "Moorpark." This is most unsatisfactory as regards yield. Another serious drawback to this variety as a canning apricot is its uneven ripening, that is, a portion of the fruit (one-half, perhaps) may be ripe, whilst the remainder is quite green. Further, the Moorpark apparently is not a satisfactory apricot to grow in a hot climate. Other varieties grown for canning purposes are Shipley's (also known as Blenheim), Royal, Hemskirke, Tilton and Trevatt. The last-named is an Australian-raised variety, and so far, appears to be the most satisfactory apricot for both canning and drying purposes.

Here, again, however, we have need of a variety that will be satisfactory alike to both canners and growers.

I have confined my remarks to canning varieties of peaches and apricots, because these, together with pears and pineapples are the principal fruits that are canned. The production of these fruits has had, and will continue to have, a very important bearing upon the development of the irrigable areas of Australia, particularly in those States bordering the Murray River. The canning of pears and pine-apples does not at present require the same urgent attention as peaches and apricots.

Productivity of Individual Trees.

The planter of an orchard, or the purchaser of trees, handles good, bad and indifferent ones. All and sundry are planted out with the expectation that each one will produce crops, which will furnish the grower with a profit over and above the cost of maintenance plus interest on the capital outlay.

A number of the trees planted out grow indifferently and produce indifferent crops. This applies to both citrus and deciduous trees. The trouble may be due to the class of bud or scion from which the tree was propagated, the soil type of the orchard, or a combination of both. The bud may have been taken from immature wood, or from a section of wood that produced a poor class of bud; on the other hand, the bud may have been obtained from an indifferent tree. The fact remains, however, that in every orchard throughout Australia one can see trees of comparatively weak growth producing unpayable crops. Some means of reducing the number of these unprofitable trees is necessary.

Pollination Studies.

Probably the greatest cause of low yields in deciduous orchards is faulty setting of the blossoms, or the dropping of the fruit at an early stage. This is probably due to one or more of the following causes:—

(*a*) Self-sterility of the variety;
(*b*) Unsuitability of adjacent variety for cross-pollination;
(*c*) Poor nutrition of the trees.

Self-sterility may be due to faulty pollen or to peculiar morphological features, which render "selfing" impossible. The anthers may not ripen during the receptive period of the stigma.

Unsuitability of adjacent varieties for cross-pollenizing each other may be due to the fact that they blossom at widely different periods. Again, in certain cases there is known to exist an incompatibility between varieties. This is largely unexplained, but has to do with their gametal composition.

Faulty nutrition is another factor about which little is known. However, many immature fruits fall which have actually been fertilized —the embryo aborting at a later date. Sometimes the pollen grain germinates, but the tube fails to penetrate the full length of the stigma.

The subject should be attacked from three angles:—

1. Field observation for self-sterility and incompatibility.
2. Microscopical and macroscopical studies of the morphology of fruit buds, flowers; and the fertilization and growth of the embryos.
3. Biochemical investigations.

Field observations. These need not be restricted to an experimental orchard, but could be carried out on trees elsewhere. Nevertheless, a variety plot needs to be established to furnish ideal material; and the natural progress of cross-breeding work would bring to light many facts of interest in connexion with pollination.

Systematic attempts at "selfing" should be made on all varieties by covering some of the flowers of each variety with transparent paper bags before they open, so that no foreign pollen can enter. The percentage of flowers on each tree which sets fruit under these conditions, as against the percentage the tree usually sets, should be noted by careful blossom and fruit counts.

The varieties in each fruit can then be grouped into three classes:—

1. Self-sterile.
2. Partly self-sterile.
3. Self fertile.

Also the blooming dates of each variety should be accurately kept, noting:—

1. Date of first blossom.
2. Date of full blossom.
3. Last blossom to open.

Water Requirements of Fruits Grown under Irrigation.

More data regarding irrigation matters are needed in Australia, in order that the present irrigation practices may be modified where necessary.

The water requirements of the various irrigated fruits depend on many factors, such as climate, soil, age, and nature of the trees.

A prevalent mistake in orchard irrigation is over-watering, resulting more often than not in a poorly-developed root system. The irrigationist should know how much water he is applying, and, by judicious use of the soil auger, ascertain the distribution of the water in the soil and sub-soil.

Alkali trouble is very often a direct result of haphazard irrigation practice, and in many cases can be avoided and even cured by proper methods of irrigation. Further study of the question is necessary.

Irrigation appears to affect the quality of irrigated fruit in certain ways.

The keeping quality in cool store, the colour, the flavour, &c., are dependent to a certain extent on the irrigation practice.

Definite information on these matters is bady needed.

In brief, the main aspects of fruit-irrigation requiring investigation and elucidation are:—

1. Soil conditions as they affect and are affected by irrigation and the occurrence of soil alkali.
2. Optimum quantity of water for various fruits, soils and climates.
3. Frequency of irrigation.
4. Optimum time of application of water in regard to blossoming, setting of fruit, ripening, harvesting, &c.
5. The effect of irrigation practice on the quality of fruit.
6. The comparative merits of the different methods of irrigation such as furrow, basin, spray, &c.

Conclusion.

The foregoing is a bare outline of a few horticultural problems that need urgent investigation, and when some of them are solved we can then look for greater returns of fruit per tree, resulting in greater prosperity to growers and to the country as a whole.

In conclusion, I desire to add that the Victorian Department of Agriculture proposes at an early date to establish a research orchard in the Goulburn Valley, with a view to working on some of the problems here mentioned.

VITAMIN CONTENT IN MILK.

From Lyons comes a report upon the Vitamin content in ordinary and in dried milk. The writers give the results of their studies on the comparative content in Vitamines A, B and C of the same samples of milk before and after desiccation. Their experiments were made on guinea-pigs and white rats reared on experimental rations tested and standardized in their laboratories. Both the liquid and dry milk used was obtained daily from a dried milk factory. No experimental modification was introduced into the conditions of the liquid milk treatment before or during desiccation. The writers declare that the results of the experiments on comparative feeding show that there is no measurable deterioration of vitamines A, B or C during the desiccation of fresh milk by the Just double cylinder process; the deteriorations or decreases of these vitamines, which are sometimes observed in isolated samples of milk dried by this process, must therefore be attributed to other factors than the actual process of drying.

[*Live Stock Journal*, 28.10.1927.

EXPERIMENTAL POTATO TRIALS.

MILLBROOK, 1926–27.

By J. T. Ramsay, Potato Expert.

The results obtained from last season's trials on the above experimental field are given hereunder. The rich red volcanic loam of this district is typical of a very large area in the central highlands of Victoria, noted and utilized for many years as an excellent medium for the production of high quality potatoes.

The production of Victoria's total annual crop is very largely contributed to by the quantity grown on this class of soil; therefore the results of this experimental work are of considerable importance to potato growers operating in such districts. The season was only moderately favorable, as will be seen by the accompanying rain registrations. These were from the date of planting, as follows:—

26th October, 1926	6 points
4th November, 1926	40 ,,
5th November, 1926	34 ,,
6th November, 1926	7 ,,
9th November, 1926	1 ,,
18th November, 1926	52 ,,
7th December, 1926	41 ,,
17th December, 1926	50 ,,
22nd December, 1926	46 ,,
6th January, 1927	20 ,,
7th Januray, 1927	14 ,,
3rd February, 1927	20 ,,
5th February, 1927	33 ,,
20th February, 1927	1 ,,
24th February, 1927	18 ,,
1st March, 1927	1 ,,
18th March, 1927	65 ,,
7th April, 1927	1 ,,
11th April, 1927	8 ,,
13th March, 1927	3 ,,
14th March, 1927	4 ,,
15th March, 1927	1 ,,
18th April, 1927	11 ,,
22nd April, 1927	12 ,,
27th April, 1927	16 ,,
Total	505 ,,

The resulting crop was fairly good, as can be seen from the figures following, the average working out at somewhere approximating 6 tons to the acre. Practically no disease affected the crop, which dug a good sample of very fine quality. The absence of disease is attributed very largely to the practice of treating seed prior to planting in a formalin antiseptic solution, and to the care exercised in the treatment and selection of seed.

The trials were designed to gain information on the most profitable manuring of potatoes suitable for this class of country, spacing test, varietal test, imported versus home-grown seed, best time of cutting,

selected seed versus unselected, box storage of seed as against bag storage, cultivation tests, bare fallow versus green manure.

To eliminate as much as practicable the margin of error, four separate lots were taken out of each variation of treatment—manurial or otherwise—and the average of these four is given in the figures presented.

Time of Cutting Seed Test.

The first table given here illustrates the results obtained in the test for time of cutting seed. The practice of cutting seed at various distances of time prior to planting has been the subject of much discussion and argument amongst potato growers for many years; so much so that it was considered advisable to try this out at Millbrook, where is the main potato experimental station conducted by the Department.

The results obtained during the past season support what has been advocated, namely, that seed freshly cut, planted as soon as possible, gives the best yield.

TABLE I.—TIME OF CUTTING SEED.

	Yield per acre. T. c. q.
Fresh cut and planted	6 19 1
Cut 1 week before planting	5 17 3
Cut 2 weeks before planting	5 4 2
Cut 3 weeks before planting	4 19 0

It will be seen from this that there is a progressive decrease in the yield per acre as the period of time between the cutting and the planting increases. This point in potato cultivation is of sufficient importance to justify a continuance of the demonstration, in order that further authentic figures may be available to growers.

The splendid results obtained from the use of the copper carbonate dry pickle in controlling fungus diseases in wheat suggested that it might be equally effective, and more easy to use than the formalin wet pickle, which has proved itself to be effective in controlling diseases affecting the potato crop. Copper carbonate dry pickle, therefore, was tested against the formalin wet pickle, and from the earliest stages of growth of the crop it was evident that the dry pickle had a detrimental effect. Until the end of the season, however, it was not known whether subsequent recuperation would more than make up for this early setback. The ultimate figures are: Copper carbonate treatment, together with 3 cwt. of super per acre, yielded 5 tons 4 cwt. 2 qrs.; whereas the formalin-treated seed gave a yield of 6 tons 19 cwt. 1 qr. From this it is obviously advisable that growers should practise the formalin treatment until some other specific may be found to be more effective.

Spacing Test.

The spacing of the potato crop has been another point on which there has been a good deal of argument and much variance of opinion. For a good many years past I have strongly advocated close planting, and when judging at the various potato crop field competitions throughout the State I have stressed the advisability of either reducing the width

between the rows or the width between the sets in the row. To demonstrate the soundness of this advice, a spacing test was introduced in the Millbrook plots last year, the results of which are tabulated hereunder:—

TABLE II.—SPACING TESTS.

	Yield per acre. T. c. q.
11 inches between sets, 27 inches between rows	8 3 1
12 ,, ,, 30 ,, ,, ...	7 18 2
16 ,, ,, 27 ,, ,, ...	6 8 1
16 ,, ,, 30 ,, ,, ...	6 19 3
20 ,, ,, 27 ,, ,, ...	6 13 3
20 ,, ,, 30 ,, ,, ...	6 2 3

Though there is not much difference shown in the figures obtained from this one year's trial, there is a fairly constant reduction in yield from the wide spacings as compared with the closer spacings. Under no circumstances should the width between the rows exceed 2 ft. 3 in., which is equal to 29 rows to the chain; and it would be better in the majority of cases if 30 to 31 rows per chain were planted.

Imported *v.* Home-grown Seed.

A trial was made of seed imported into Millbrook from Catani, as against seed which had been grown at Millbrook for a number of years. To illustrate the advisability or otherwise of changing seed from one district to another, the figures obtained are given in the following table:—

TABLE III.—TESTS WITH "IMPORTED" AND HOME-GROWN SEED.

	T. c. q.
Millbrook seed	7 16 2
Catani seed	5 9 2
Increase in favor of Millbrook seed	2 7 0

It is not suggested by the presentation of these figures that this percentage increase would be obtained every year by the planting of home-grown seed, because probably much of the increase was due to better selective treatment being applied to the home-grown seed than that to which the imported seed had been subjected. As a matter of fact, the necessity for change of seed depends entirely on the constitution of the seed parcel which a grower may have on hand; that is to say, if he has vigorous stocks doing well in his class of country it is inadvisable to discard this and supplant it with seed from another district which may not have the same strength of constitution. The mere change of seed from one class of soil to another, or from one climate to another, does not necessarily effect improvement in production; it is the virility of the seed itself which counts, and this depends entirely on the method of selection and the treatment meted out to it during storage. Selection and correct storage, therefore, are the vital points to which the grower should direct his attention in the matter of obtaining prolificacy of any variety. When growers pay reasonable attention to the selection of suitable seed and its correct storage, the superstitious beliefs in the efficacy of change of seed will be laid.

Boxed Seed *v.* Bagged Seed Trial.

A trial was conducted to demonstrate the effect on the yield of the two systems of storage of seed potatoes, viz., bagged storage versus boxed storage. The result of this produced figures strikingly supporting the boxed system of storage; the figures were:—

TABLE IV.—RESULTS FROM BOXED AND BAGGED SEED.

	T.	c.	q.
Boxed seed	6	19	1
Bagged seed	5	1	3

The super-efficiency of boxed seed has been so long and so clearly demonstrated that it is a matter of wonder that every grower has not adopted the system. Not only is there a marked increase in the crop grown from boxed seed as against bagged seed, but there is a tremendous saving of loss of potatoes during the storage period by the prevention of the progress of fungus diseases. A striking instance came under my notice this year where a grower who had boxed potatoes sold several tons to a neighbour. They were bagged from the boxes and delivered about six weeks prior to the date on which they were planted, during which time they were allowed to remain in the bags. They were planted at practically the same time and under the same conditions as the boxed seed of the grower from whom they were obtained. The bagged seed showed about 10 per cent. loss from deterioration, whereas there was practically no loss in the case of the seed which had remained in the box all the time.

Selected Seed Trial.

In the selected seed trial further support was obtained to prove the benefit accruing from this practice. The result obtained was:—

TABLE V.

	T	c	q.	
Selected seed	7	2	0	
Unselected seed	5	12	1	
Increase due to selection ..	1	9	3	equalling 26 per cent.

Further comment on this is unnecessary.

Cultivation Test.

The cultivation test again proved interesting, showing as it did the benefit of thorough inter-cultivation of the crop during the growing period.

TABLE VI.—CULTIVATION TESTS.

	Large.			Small.			Total.		
	T.	c.	q.	T.	c.	q.	T.	c.	q.
Cultivated once ..	4	11	0	1	1	1	5	12	1
Cultivated twice ..	6	8	3	0	13	1	7	2	0
Cultivated thrice ..	6	19	1	0	13	1	7	12	2

These figures give very substantial backing to the figures obtained in a similar test last season. It will be noticed that while there is a marked

increase due to the extra cultivation, there is a corresponding decrease in the small or non-marketable sized tubers where the additional cultivation was given. The cost of these cultivations in so small per acre that growers would show a very handsome increase in the money value of the crop by giving more attention to them.

Immature *v.* Ripe Seed.

Immature seed again proved its superiority over ripe seed. The treatment of the two classes of seed in the matter of cultivation, manuring, soil and variety was exactly the same, the result being:—

TABLE VII.

	T.	c.
Immature seed	7	2
Ripe seed	5	7
Increase due to immature seed	1	15

Bare Fallow *v.* Green Manure.

In districts where there is a small rainfall, the tremendous benefit derived from bare fallowing has been amply demonstrated. In districts with a good rainfall, say 25 inches or over, it is questionable, to my mind, whether bare fallowing is an economical proposition. It appears that the practice in a heavy rainfall district should be to keep the soil occupied with crop as much as possible, even if that crop has to be utilized as a green manure crop. Twofold benefit is obtainable by this means, as not only is the soil built up by ploughing in some crop as a green manuring crop, but its moisture-retaining capabilities, especially during the summer months, is considerably augmented. A trial was made at Millbrook last season to compare these two methods. Peas were used for the green manure crop, and owing to the dryness of the previous season was only a light crop when ploughed under; but, notwithstanding that, they stood well to the succeeding potato crop, so well indeed that an extra yield of 1 ton 11 cwt. 3 qrs. was obtained from the portion of ground green manured as compared with the bare-fallowed portion. The figures are given hereunder:—

TABLE VIII.—GREEN MANURE AND BARE FALLOW TRIAL.

	T.	c.	q.
Green manure	8	11	0
Bare fallow	6	19	1

On account of the poor physical condition into which much of this red volcanic country is getting, due to constant cropping and feeding only with inorganic manures, growers are finding it difficult to produce and maintain a good tilth on these worn soils, notwithstanding the fact that their natural fertility is high, even now. Green manuring with either rye, grain, peas or some other crop, appears to me to be the only feasible method of reconditioning these soils, so that they may be much easier to work and much more responsive to treatment. The cost of green crops is but small, and as for the most part they are grown in what might be said to be out of season, there is no reason why the practice could not be more generally adopted with considerable benefit.

Treating Seed with Nitrate of Soda.

A test was carried out to see if the treatment of seed with a solution of nitrate of soda up to 10 per cent. strength, prior to planting, would be of any benefit to the crop, but when the harvesting was made of this section there was practically no difference between the treated and untreated portions. The Millbrook soil analyses very high in nitrogen, and it is just possible that seed planted on soils low in nitrogen might show some benefit from this practice.

Varietal Tests.

The following table gives the results of the varietal trials, all of which were carried out on soil manured with superphosphate at the rate of 3 cwt. per acre.

TABLE IX.—RESULTS OF VARIETAL TRIALS.

Variety.	Yield per acre. T. c. q.
Carmen No. 3	7 16 2
Late Beauty of Hebron	6 16 2
Arran Victory	6 9 2
Minato	5 4 0
Carmen No. 1	4 12 0
Earliest of All	4 11 0
Brown's River	4 11 0
Manhattan	4 5 3
Duchess	4 5 3
Excelsior	4 5 3
Brownell's Beauty	4 0 1
Red Ohio	3 7 0
Wellington	3 7 0
Sussex	3 7 0

Manure Trials.

One of the most interesting of the trials conducted at Millbrook is probably the manure trials, the results of which are given in the final table. In estimating the value of these, the market-sized tubers have been valued at £5 per ton, which was really much below the average price for last season; but as the results of other stations on which experimental plots were conducted were calculated on this valuation, it has been decided, for the sake of uniformity, to show the Millbrook results on the same basis. Only the market-sized tubers have been taken into consideration in the matter of weights per acre and acreage values. The manure costs per acre have been calculated on Melbourne prices, plus £1 per ton to allow for cost of freight, cartage, and application.

As in previous seasons, on this red volcanic soil, the moderate dressing of 3 cwt. per acre of superphosphate shows to the best advantage, and it has been decided this year to test that rate in conjunction with ammonium sulphate, instead of the 6 cwt. super and 1 cwt. ammonium sulphate dressing which is giving such excellent results on all of the other experimental stations.

A curious feature of these results, which is consistent, is that heavy dressings of superphosphate have a depressing effect on the yield. Why this should be so is not clear.

At the end of the table showing the manurial results is given the average performance for four years of each of the nine manurial variations, and a study of it will show that the 3 cwt. superphosphate per acre alone has consistently given the best result, and that there is really very little difference between the 6 cwt. super. and 1 cwt. of ammonium sulphate, 6 cwt. super and 1 cwt. potassium sulphate, 6 cwt. super, 1 cwt. potassium sulphate and 1 cwt. ammonium sulphate, and the dressing of 3 cwt. market garden manure per acre, these four variations in the four year average ranging from 55 to 57 per cent. increase. It is very noticeable, however, that a marked increase per acre took place in the case of all manures, a fact which should be taken notice of by potato growers utilizing that class of soil. It has been the contention for many years of land-owners in this district that the rich red volcanic highlands of Victoria do not want and would not respond to treatment with artificial manures. During the six or seven years that this Department has been conducting the tests at Millbrook, there has been no single instance of the soil failing to respond to manurial treatment, and to respond to a profitable degree, even in a season of low prices.

Summed up, the results of the departmental trials on all of the stations, of which there are now eleven in various parts of the State, and on various classes of soil, show most conclusively that the potato crop demands intelligent and liberal manuring, good seed, correct seed treatment, and thorough cultivation, and in cases where these are given, there is no question about the crop being a profitable one.

TABLE X.—RESULTS OF MANURE TRIALS ON POTATOES AT MILLBROOK, 1926-27.

Plot.	Manures.	Market Size Tubers.	Increase from Manuring.	Cost of Manure	Cost per ton Increase.	Increased Value per acre.	Net increased Value per acre.	Percentage Increase.
		T. c. q.	T. c. q.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	Per cent.
1	3 cwt. super.	7 16 2	3 4 3	0 18 9	0 5 9	16 3 9	15 5 9	90
2	6 cwt. super.	6 15 1	3 3 2	1 17 6	0 11 10	15 17 6	14 0 0	87
3	9 cwt. super.	6 0 2	2 8 3	2 16 3	1 3 0	12 3 9	9 7 6	68
4	6 cwt. super. 1 cwt. pot. sulph.	6 14 0	3 2 1	2 13 0	0 16 10	15 11 9	12 18 9	86
5	No manure	3 11 3	..	..	..	..	..	...
6	6 cwt. super., 1 cwt. ammon. sulph.	6 1 3	2 10 0	2 15 0	1 2 0	12 10 0	9 15 0	69
7	6 cwt. super., 1 cwt. ammon. sulph., 1 cwt. pot. sulph. ..	6 14 0	3 2 1	3 10 6	1 3 0	15 11 9	12 1 3	86
8	3 cwt. market garden manure ..	5 12 1	1 0 2	1 8 6	1 8 4	5 2 6	3 14 0	27
9	3 cwt. basic super.	5 1 3	1 10 0	0 18 9	0 11 8	7 10 0	6 11 3	41

AVERAGE FOR FOUR YEARS, 1923-24 TO 1926-27.

	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.	Plot 7.	Plot 8.	Plot 9.
	T. c. q.	T. c. q.	T. c. q.	T. c. q.	T. c. q.	T. c. q.	T. c. q.	T. c. q.	T. c. q.
Average four years ..	9 2 0	8 11 3	8 9 1	8 16 2	5 13 3	8 17 2	8 19 0	8 18 3	8 11 0
Increased Average ..	3 8 1	2 18 0	2 15 2	3 2 3	..	3 3 3	3 5 1	3 5 0	2 17 1
Average Percentage Increase	60%	51%	48%	55%	..	56%	57%	57%	50%

FRESH GRAPE SHIPMENTS.

By F. de Castella, Government Viticulturist.

During the year that has just closed further attention was given to the problem of the export of fresh grapes, and experimental shipments on a small scale were made to London, Vancouver, and New York. Cool storage experiments were also conducted at the Government Cool Stores as in previous seasons, including control experiments with some cases kept back from the overseas shipments and experiments with grapes of different vine sorts from the Rutherglen Viticultural Station. Experiments were also made with different methods of packing, viz., the now familiar pack in the three-quarter bushel case with cork filler, a similar pack wth sawdust filler instead of cork, and the recently introduced sulphite paper wrapper and wood wool pack.

The outstanding feature of the 1927 grape season was its remarkable suitability for the production of grapes for shipment; finer grapes have probably never been vintaged. All the grapes, irrespective of style of packing, opened up in very good order. This was somewhat disappointing for comparative purposes; the experiments were thus rather inconclusive, no definite lessons in the way of strikingly different results being provided.

The excellent conditions under which the grapes were grown encouraged more extensive export by private growers than in 1926, in which year only 1,422 cases were exported from Victoria. In 1927 the number was 6,222, of which the bulk was shipped to eastern ports; in addition, 697 cases were exported to Colombo and 561 to New Zealand. As in 1926 our growers refrained from again trying the London market, the unsatisfactory results of the 1924 and 1925 grape shipments to London still acting as a deterrent.

It will be seen that though some advance has been made in our fresh grape export, its importance is as yet only trifling, and but a small fraction of what the potentialities would seem to justify. The failures of 1924 and 1925 have given the industry a set-back from which it may take years to recover. Further experimentation is thus very desirable for the double purpose of restoring confidence and demonstrating the main causes of failure.

Experimental Shipment per s.s. *Mooltan* on 12th April, 1927.

This small shipment consisted of 60 cases and 29 crates. The cases were of three-quarter bushel capacity, 24 in. x 6 in. x 11¾ in., the grapes being packed with granulated cork filler. The crates (20 in. x 12 in. x 14 in.) each held eight cartons containing 5 lb. of grapes, the bunches being wrapped in sulphite paper and packed with wood wool.

These were supplied from three different districts, viz., Merbein (Mildura Shire), Woorinen (Swan Hill Shire), and Shepparton.

The Merbein Grapes comprised 44 cases, made up as follows:—

Grown by Mr. S. Thompson.

4 cases packed with untreated cork, Nos. 3, 5, 29, and 49.
4 cases packed with treated cork, sample A, Nos. 31, 32, 21, and 17.
7 cases packed with treated cork, sample B, Nos. 1, 8, 11, 12, 18, 20, and 42.

Grown by Mr. Constable.

3 cases packed with untreated cork, Nos. 6, 37, and 51.
4 cases packed with treated cork, sample A, Nos. 7, 14, 24, and 30.
7 cases packed with treated cork, sample B, Nos. 9, 34, 36, 38, 41, 44, and 47.

Grown by Mr. Flattley.

3 cases packed with untreated cork, Nos. 25, 33, and 35.
5 cases packed with treated cork, sample A, Nos. 4, 16, 22, 26, and 39.
7 cases packed with treated cork, sample B, Nos. 13, 19, 23, 27, 28, 40, and 46.

The Woorinen Grapes comprised 11 cases, marked respectively W1, W2, W3, W5, W6, W7, W9, W10, W11, W12, W14, and W15. The grapes in W3 and W6 were sulphured. These are the only sulphured grapes in the shipment.

The Shepparton Grapes comprised 5 cases and 29 crates. The cases were numbered respectively S2 to S6. The crates were not numbered. They each contained 8 cartons of grapes, wrapped in paper and packed with wood wool.

The grapes are all of the Ohanez variety. The points concerning which information was particularly desired were—

1. The difference in condition between the grapes packed with cork filler (Nos. S2 to S6) and those in the crates (paper and wood wool).
2. The difference in condition between grapes packed in treated and untreated cork, comparing as much as possible grapes from the same grower; there should be little difference between sample A and sample B cork.
3. The difference between sulphured grapes (W3 and W6) and the other grapes from Woorinen (W2, &c.).
4. Particulars of interest in connexion with any of the cases, stating number and letter on case.

It was desired that four cases, Nos. 14, 47, 51, and 83, and one crate be delivered to Dr. Butler, Director of the Imperial Bureau of Mycology, Kew Green, Surrey, for examination. Two crates were crushed by sling ropes when loading on the steamer. It was desired that one of these be examined as well as a sound one.

It was also suggested that the Department of Scientific and Industrial Research be advised of the arrival of the grapes and invited to inspect them.

Arrangements were also made for inspection and sale of the grapes as in previous years.

The grapes went into the Government Cool Stores on 8th April. They were thus precooled for three days before loading on the steamer. It had been intended to ship in a special experimental chamber on one of the "Bay" liners, as was done in 1926, but when the shipment was finally decided on space was not obtainable. Other arrangements had to be made, and space was secured on Peninsular and Oriental s.s. *Mooltan*. The grapes were accordingly shipped by this steamer in one of the large apple chambers, already nearly filled with apples from Tasmania. In this they were favorably located, in close proximity to the coils, thus avoiding undesirable influence from the still rather warm apples.

The *Mooltan* reached London about the middle of May, the grapes being sold on the 25th of that month. Account sales were furnished as follows by Messrs. M. Isaacs and Sons Limited:—

Account sales of 89 boxes grapes, *ex Mooltan*, sold by order and for account of the Agent-General, Government of Victoria, Australia, by M. Isaacs and Sons Limited.

1927	Boxes	£ s. d.	
May 25th	4 ..	2 18 0	
	52 ..	35 10 6	
	27 ..	21 14 6	
	6 D/O		
	— 89	———	£60 3 0

Our Charges.—Exclusive of sums payable by buyers under conditions of sale. Inclusive of dock and wharf charges and/or warehousing, sorting, sale expenses, delivery, &c.

	£ s. d.	
Packages—ordinary size	5 18 8	
Advertisement expenses	0 3 9	
Brokerage and guarantee	1 4 1	
	———	£7 6 6
		£52 16 6

London, 31st May, 1927.
For M. Isaacs and Sons Limited.

The following reports concerning the condition of the grapes on arrival and the results of their examination were received from the Agent-General:—

Report of Mr. H. R. Hassan, Acting Trade Commissioner. Dated 31st May, 1927.

Experimental Shipment of Grapes ex s.s. "Mooltan."

I attended Messrs. M. Isaacs and Sons' warehouse, 4 Eastcheap, London, E.C., on the 25th May, and inspected the following cases *ex* the above shipment:—

MERBEIN GRAPES, GROWN BY MR. S. THOMPSON.

Untreated Cork—

No. 49. Quality good—on immature side—berries and bunches medium to large.

No. 34. Good large berries, medium bunches, very slightly defective.

Treated Cork, Sample "A"—

No. 32. Good quality, berries and bunches large to medium, on immature side.

Treated Cork, Sample "B"—

No. 8. Berries good, large, rather immature, bunches fair size, cork rather large.

GROWN BY MR. CONSTABLE.

Untreated Cork—

No. 6. Good, bunches large, berries medium.

Treated Cork, Sample "A"—

No. 30. Medium berries, fair bunches, cork too large.

Treated Cork, Sample "B"—

No. 41. Medium berries, fair bunches, a little better colour, cork too large.

MERBEIN GRAPES, GROWN BY MR. FLATTLEY.

Untreated Cork—

No. 33. Good quality, good colour, medium bunch and berries.

Treated Cork, Sample "A"—

No. 39. Good quality, good colour, medium bunch and berry.

Treated Cork, Sample "B"—

No. 13. Rather dull appearance, medium berry, large bunches.

WOORINEN GRAPES.

Sulphured—

W3. Dull in colour, defective, stale in appearance.
W6. Good quality, medium to large berry, large bunch.

Not sulphured—

W9. Rather dull, defective, medium berry, medium to large bunch.

SHEPPARTON GRAPES.

S3. Good large berry, medium bunch, slightly defective, immature.

Crates containing 8 cartons of grapes wrapped in paper and packed with wood wool—

This package not recommended, and undesirable except for strictly fancy fruit in large bunches, and then only in cartons of one layer (half depth). Bunches much too small for such expensive package.

Quality good, immature, medium berry, small to medium bunches.

The outturn generally shows decided improvement on anything so far received from Australia, although there is still room for further improvement. It is to be noted that grapes arriving at this time of the year are to meet the requirements of the better-class trade, and consequently large bunches are desirable, no less than large berries. I saw instances of small bunches of no more than from nine to twelve small berries, which are most undesirable.

The difference in condition between fruit packed with cork filler (S2 to S6) was negligible, if any; similarly between fruit packed in treated and untreated cork. The sulphured fruit, W3 to W6, had a decided stale appearance, being dull in colour, while other Woorinen fruit (W2, &c.) were similarly affected, but to a less extent.

A shipment of Argentine fruit on show at the same time compared unfavorably with the *Mooltan* shipment. The latter shipment brought complimentary remarks in respect to the portion packed in cork.

The cork packing generally on the harsh side, and in some instances very coarse indeed. Where cases reported defective, same was only slight—very slight—an odd berry here and there.

I append copy of letter received from Messrs. M. Isaacs and Sons Limited, dated the 25th May, *re* this consignment—

> "We beg to enclose you catalogue showing sales of grapes *ex* the s.s. *Mooltan*, and as your representative saw the fruit, we have no need to comment at length upon it.
>
> "The demand for grapes to-day was very good, and they would undoubtedly have obtained higher prices had the parcels been larger. We have also to bear in mind that our buyers had to accept those which had been shown, and they were of considerably less value, which of necessity reduced the prices.
>
> "We had a visit from Dr. Butler, who closely inspected the fruit, and he will doubtless make his comments."

I attach sales catalogues of Messrs. Isaacs and Sons Limited, showing the prices realized.

(Signed) H. R. HASSAN,
Acting Trade Commissioner.

Report of Mr. S. F. Ashby, Mycologist, of the Imperial Bureau of Mycology, Kew Green, Surrey.

Mycological Examination of Grapes from Victoria by s.s. *Mooltan*, May, 1927.

Four boxes numbered respectively 51, 14, 47, and S2, and two crates marked A.G.L. were delivered on 25th May. The packages were opened up, and the contents examined between the 25th May and 2nd June.

The fruit was found in very good condition in all four boxes and one crate, wastage due to decay being inappreciable. In the other crate, which had been

damaged in loading, three of the cartons had been subjected to pressure, and the fruit next to the cardboard crushed, and from two other cartons bunches were missing. The crushed berries carried a heavy development of blue mould (*Penicillium expansum* Lk.), which was not transmitted to the adjacent fruit with uninjured skins; most of the fruit in the damaged crate was in as good condition as that in the sound crate.

Bunches from boxes and crates were hung in the dry air of the laboratory for three weeks, and others left in the original packing. Those hung showed in some instances marked shrinkage of the fruit, associated with brown flecking of the skins and separation of the berry from the "pad" when the bunch was shaken; bunches from the same container varied greatly in the amount of shrinkage and surface blemish, and no appreciable differences were noted in the behaviour of those from the different packages. The fruit left in the boxes with the cork, and those wrapped in tissue in the cartons, underwent practically no change during three weeks.

Fungi on the stalks, branches, and the pedicels of the berries were determined from growth in the moist chamber, planting tissue fragments on agar, and plating out washings.

Fungi on stems from Shepparton (box S2 and undamaged crate):—

Penicillium expansum Lk.
Cladosporium herbarum Lk. (Hormodendron).
Penicillium digitatum Sacc.
Alternaria sp.
Dematium sp. (pink).
Botrytis sp.

Fungi on stems from Merbein (boxes 51, 47, and 14).

Penicillium expansum Lk.
Penicillium digitatum Sacc.
Penicillium roqueforti Thom.
Cladosporium herbarum.
Alternaria sp.

The small amount of berry decay in both lots was due mainly to the *Penicillium* spp., especially *P. expansum;* the associated rot was watery, with skins tender and easily broken. Less frequently the rot involved gradual shrinkage with tough skins, associated either with an internal *Oospora* sp., or more rarely with *Botrytis.* The ripe-rot fungus (*Glomerella cingulata*) was not detected.

Fungi on Granulated Cork.

Platings were made with pieces of the cork from the boxes 51, 14, and 47; the pieces were planted out in the agar medium to obtain growth from mycelia as well as spores. In box 51 (cork untreated) the fragments were lumped occasionally; pieces from the broken lumps were used for the platings. No lumping of the cork occurred in boxes 14 and 47; it was in larger pieces in 47 than in 51 and 14.

Fungi on Lumpy Cork in Box 51—

Mucor plumbeus Bonord (from all pieces).
Mucor sp. (*Cymo-mucor*) (from 10 per cent. of pieces).
Mucor sp. (*Racimo-mucor*) (from 5 per cent. of pieces).
Penicillium expansum.
Penicillium roque forti.
Cladosporium herbarum.
Spicaria sp. (yellow).

Cork in Box 47—

Mucor plumbeus (15 per cent. of pieces).
Penicillium expansum.
Cladosporium herbarum.
Citromyces sp.

Cork in Box 14—

Penicillium expansum.
Cladosporium herbarum.

The fruit in box 14 was in particularly good condition.

Shrinkage of Stems—

A small proportion of the bunches, especially among those from Shepparton, retained the green colour and fullness of the stalk branches, but most showed a more or less extensive browning and shrinkage of the main stem and branches, and the pedicels to a less amount. This change frequently appeared to work up from the cut end of the stem, and was frequently more advanced in the tissues, the browning being due to disorganization of cell contents in the branches than in the main stem. Sections showed no hyphae of fungi in the tissues, the browning being due to disorganization of cell contents in the epidermis and sub-epidermal layer, and loss of moisture from the inner cortex. Platings from the internal tissues yielded no growths; platings from unsterilized external tissue fragments yielded moulds from the surface. The disorganization of the cell contents in the external layers appears to be of non-parasitic origin. When such bunches are exposed to humid air an abundant growth of *Penicillium expansum* and other *Pencillium* sp. occurs, with a rusty odour; this happened when the stalks became moist in one of the boxes, though packed in cork, and was due probably to high and then to low temperature.

A Fruit Blemish—

A few berries could be picked from most bunches, and both lots, but more especially from the crated fruit from Shepparton, showing a single depressed area extending from the insertion of the pad to a variable distance towards the tip. By transmitted light it was opaque, due to the presence of a brown, toughened tissue in the pulp beneath the skin, and of some depth; the vascular bundles traversing the brown tissue were also discoloured. Such berries in bunches that had hung for three weeks were greatly shrunken, but not decayed, and the affected tissue had not extended. Affected berries were found on bunches with green full pedicels as well as on those with brown and shrunken pedicels. No hyphae could be detected in the tissue, and no fungus grew in culture. Minute bodies staining like "cocci" or "bacillococci" were present in no great abundance in the browned tissues, but no development occurred in nutrient media. The blemish appears to be of a non-parasitic nature, and may be present in the fruit before picking. It does not render the fruit inedible. A brown specking of the skin in patches was present on the fruit of some bunches when the boxes were first opened, and became more conspicuous after hanging for three weeks. These patches showed no surface growth of a fungus, and hyphae were not detected in the tissues of the skin. It did not appear to render the fruit more liable to decay, but promoted shrinkage during hanging.

Report of Mr. J. Barker, Low Temperature Research Station, Downing-street, Cambridge.

Experimental Shipment of Victorian Grapes per s.s. *Mooltan*, May, 1927.

Merbein Grapes—

The grapes from all three growers were in sound condition, apart from a little mould on the stalks, and the presence of one or two squashed berries in a few bunches in each box. An examination of part of the contents of the cases containing treated and untreated cork from each of the three growers revealed no significant difference in the condition of the grapes. An examination of the whole of the contents of cases 31 and 5 from Mr. Thompson, containing treated and untreated cork respectively, showed that although many bunches of grapes in the two were in similar condition, there was, on the whole, less mould on the stalks of the grapes packed in the treated cork.

The above remarks indicate the very slight difference to be observed in the condition of grapes packed in treated and untreated cork. It should be realized that the amount of mould present on the stalks of the grapes at the examination in the agents' warehouse, was extremely small, and would not affect the value of the grapes.

To find out whether cork treatment had any effect on the subsequent wastage, half the contents of the above boxes (31 and 5) from Mr. Thompson were re-packed in the original cork, the other half being kept on trays in a damp atmosphere. Examinations of these grapes during the following three weeks, both as regards amount of mould on the stalks and the proportion of mouldy berries, showed no significant difference between the two boxes of grapes.

Woorinen Grapes—

These grapes were not in such sound condition as the Merbein samples. They were a dull yellow colour, and each bunch contained five or more squashed or mouldy grapes. The bunches were slightly damp, and mould was present on the stalks, which were often soft. The grapes were not attached to the stalks as firmly as in the Merbein samples.

No difference in condition was observed between the sulphured and the non-sulphured grapes.

The relatively greater wastage in the Woorinen grapes may be related to the fact that these grapes were considerably riper, as judged by colour and taste, than the Merbein sample. In view of this wastage, it would be of interest to know whether the cork used in packing the Woorinen cases was treated or untreated.

Since the wastage in the Merbein cases was practically negligible for both treated and untreated cork, the experiment provides no evidence as to the advantage of the treatment. It is thus unfortunate that Woorinen grapes were not packed in both treated and untreated cork.*

Trial Shipment to Vancouver.

This consisted of 75 cases of grapes shipped from Sydney per s.s. *Aorangi,* which sailed on 5th May. The grapes were railed from Shepparton, where they were grown, to Sydney. They were packed in a special shallow case in a single layer (South African model, 26½ x 13½ x 14½) as follows:—

63 cases Ohanez variety, single layer, cork filler, 17 lb. grapes, 3 lb. cork.

2 cases Purple Cornichon, single layer, cork filler, 13 lb. grapes, 3½ lb. cork.

10 cases Ohanez, single layer, 15 lb. grapes, wrapped in sulphite paper with wood wool.

These grapes on first inspection at Vancouver were reported on 1st June to be "entirely satisfactory." Subsequent examination, however, showed some variation in condition. "In some cases the loss amounted to at least 5 per cent." It is worthy of note that the grapes packed with cork filler were landed in better condition than the paper and wood wool pack. The market at the time the grapes arrived was much depressed; the result of the shipment was disappointing. A previous advice stated that a few weeks earlier New South Wales Ohanez were selling well in Vancouver at from 30 cents to 35 cents per lb.

Trial Shipment to New York.

A trial shipment of 50 cases Ohanez grapes grown at Shepparton was sent to New York per s.s. *Canadian Scottish,* which sailed on 12th May. These were packed in the same kind of case as the Vancouver shipment (26½ x 13½ x 4½) as follows:—

23 cases, single layer, cork filler, 20 lb. grapes, 3 lb. cork.

12 cases, single layer, cork filler, 17 lb. grapes, 3 lb. cork.

15 cases, single layer, 15 lb. grapes, wrapped in sulphite paper and packed with wood wool.

Owing to the stringent regulations imposed on grapes entering New York as a precaution against the introduction of fruit fly, our grapes were not allowed to land. Though representations were made as to

* These grapes were packed in untreated cork.

the absence of this pest in this State, and inspection failing to find any trace of the insect, the embargo was not lifted. The consignment was, therefore, sent on to Montreal, where it was ultimately disposed of. On inspection at New York these grapes were reported as being in good condition; no difference was reported between those packed in cork and those in paper and wood wool. Owing partly to competition with new season's grapes from southern California, but mainly to the long delay, results of their ultimate disposal were unsatisfactory.

Experiments at Government Cool Stores.

These included control cases withheld from the experimental shipment to London and grapes of different sorts grown at the Rutherglen Viticultural Station, and stored to test their keeping qualities.

Controls from London Shipment.

These were examined on 21st June and on 22nd July.

Grapes Packed with Paper Wrapper and Wood Wool grown at Shepparton.

On the first inspection these grapes were in excellent order—9½ points out of a possible 10. An odd mouldy berry was present, averaging about two per bunch. Some bunches were quite free from them. These berries may have been injured when pushing in the carton lids; they were easily trimmed out. In other respects the appearance of the fruit was almost perfect.

On 22nd July these grapes were in much the same condition; excepting an odd faulty berry, the appearance was almost perfect; there was no sign of wilting or wrinkling. The stalks were dry, but pedicels were still green. Traces of cobwebby white mould (*Cladosporium*) were noticeable on the stalks. The grapes packed with the longest stalks were in better condition than those with shorter stalks. At this inspection it was noted that the grapes in the paper and wood wool packing were not in quite equal condition to those packed with cork filler.

Grapes Packed with Cork Filler.

The following cases, withheld from the London shipment, were examined on 21st June and 22nd July:—S1, grown by Mr. Parker, of Shepparton; WS, grown by Mr. Palmer, of Woorinen; Nos. 15, 45, and 50, grown by Mr. Constable, of Merbein; and No. 52, grown by Mr. Flattley, of Merbein. On both inspections these grapes were in excellent order—almost perfect; in fact, Nos. S1, 15, and 50 were packed with treated cork, and Nos. WS, 45, and 52, were untreated cork. As regards Mr. Constable's three cases, there was a slight but appreciable difference in favour of Nos. 15 and 50 (treated cork); No. 45 (untreated cork) showed a very few mouldy berries, and the stalks were dull and also showed traces of mould. Nevertheless it was in excellent condition, absolutely marketable and, in fact, slightly superior to the paper and wood wool packing. There were slight differences between some of the cases in such directions as the dryness of the stalks and the maturity of the grapes when picked, but they did not appear to influence the market value of the fruit.

Grapes Packed with Sawdust Filler.

Only a limited quantity of this material was available. Two cases were packed with it very late in the season. At the Royal Show in September, these were not equal in condition to those packed in cork or with paper and wood wool.

Grapes from Rutherglen Viticultural Station.

A detailed account of the behaviour of these grapes must be held over for a later issue. It will suffice to here record that eighteen different table grapes were cool-stored on 9th and 18th March, and examined on 8th and 9th June and again on 22nd July. In the order of their quality when inspected these were Ohanez, Henab, Purple Cornichon, Emperor, Doradillo, Gianetti, Valensi, Waltham Cross, Red Alicante, Woodward's Black, Red Hanepoot, Red Prince, Gordo Blanco, Amokrane, Sultana, Red May, Maravilla, and Lady's Finger.

These sorts were all stored in the paper wrapper and wood wool pack, but three of them (Ohanez, Valensi, and Waltham Cross) were also packed with cork filler. There was little difference between the two packs in the case of Ohanez. In that of Waltham Cross the cork proved slightly superior, whilst in that of Valensi the paper and wood wool was best. The difference, however, was slight.

It is noteworthy that two sorts, Henab and Gianetti, which in previous trials had shown poor keeping quality, opened up in far better condition. On the present occasion they were packed in paper and wood wool; previously they were packed in cork. These grapes owe their very firm appearance to the texture of the pulp; the skin is very thin—so thin as to be injured by the particles of cork. Hence, no doubt, the superiority of the paper wrapper pack.

Red Hanepoot, which is merely a colour variation of Gordo Blanco, seems to be of slightly better keeping quality than the latter well-known grape. It was noted that after long cool storage the Gordo Blanco loses much of its characteristic muscat flavour, especially the greener berries. Those that show a little russeting retain their flavour better. Unfortunately, none of the Muscats cool-store well. There is a weakness of the skin near the attachment of the pedicel, that seems fatal to lengthy storage.

In addition to Ohanez, which is undoubtedly the best storing grape, Emperor, Purple Cornichon, and Henab (the last packed with paper wrapper) show considerable keeping quality.

Relative Merits of Cork and Paper Wrapper.

Further experimentation with the paper and wood-wool pack is desirable before its application on a large scale can be confidently recommended. It certainly presents the advantage of cheapness, and experiments made with it so far are distinctly encouraging. In many cases, and especially for certain grape sorts, it gave highly promising results. There is nevertheless an incipient development of mould on the stalks which, even if insufficient to detract from the appearance of the fruit, suggests the need for caution. It must be remembered

that last season the grapes ripened under ideal climatic conditions. It remains to be seen how the new pack would show up in a more showery autumn.

In this *Journal* for November last Mr. Basil Krone mentions the success of some Shepparton grapes packed by the new method. Taken as a whole the experiments conducted at the Government Cool Stores do not show that grapes keep longer packed in paper and wood wool than in cork. In the majority of cases examined, indeed, the superiority was with the cork filler, especially if treated. The Shepparton grapes referred to by Mr. Krone were picked very late. It has been observed in previous experiments that very ripe grapes do not store so well in cork as those picked just as they reach maturity; perhaps the former may store better in the paper wrapper. The point merits further trial.

Weather Conditions in 1926-27.

The excellent shipping quality of last season's grapes was undoubtedly in great measure due to the climatic conditions. It is therefore as well that these should be briefly recorded.

The rainfall for 1926 in Northern Victoria was well above the average, which at Rutherglen Viticultural Station is just on 22 inches. At that station, 25.96 inches was recorded for the twelve months ending 31st December, 1926. Nearly the whole of this fell between March and the end of the year. There were frequent light rains in October (2.05 inches in ten different falls), .29 in November, and 1.29 in December. The close of the year was hot and dry. Several heat waves occurred towards the end of November and commencement of December, temperatures of up to 108 deg. F. being recorded. The new year set in hot, with very moderate rainfall, whilst the autumn was an almost rainless one. At the Viticultural Station the records for the first four months were—January, .83; February, .59; March, .22; and April, .03. The dryness and heat of January and February caused anxiety in non-irrigated districts, but good tillage following on the good rainfall of the previous year enabled the vines to stand the dry conditions admirably. In irrigated areas the rainfall was lighter than at Rutherglen and conditions were ideal, and the dry atmosphere no doubt impeded mould development to a considerable extent. Magnificent table grapes were selling in Melbourne shops and on barrows well into June.

In compiling the above notes I have received valuable assistance and suggestions from Messrs. S. Fish, B. Agr. Sc., and G. B. Tindale, B. Agr. Sc., to whom I take this opportunity of tendering my grateful thanks. To these gentlemen I am also indebted for some of the following recommendations:—

Recommendations.

1. *Variety.*—Ohanez is the best keeping grape known. Experiments have shown, however, that several more attractive grapes can be kept in good condition for periods of two to three months. Among these are Emperor, Purple Cornichon, Henab, Gianetti, Waltham Cross, &c.

2. *Bunches.*—The English market requires large bunches. Fancy prices are paid for out-of-season grapes, and large bunches are necessary for window displays. Bunches should be cut with stalks as long as possible; they should never be subdivided into smaller bunches. It takes much longer for a long stalk and its ramifications to dry out. It is the drying of the stem or pedicel that loosens the attachment of the berry, permitting it to "wobble" or even to drop off, exposing the pulp to attack by moulds.

3. *Maturity.*—Grapes must be picked when ripe or almost so. Unlike most other fruits they do not continue to ripen after picking. They should only be picked when perfectly dry. The presence of any split or mouldy berries will necessitate

4. *Trimming.*—This should be carefully executed with blunt pointed scissors. Care must be taken in

5. *Handling Bunches.*—Hold by the stalk only. A device for transporting bunches from the vine to the packing shed, suspended by the stalk, would seem desirable.

6. *Packing.*—This should be carried out in a clean shed free from any debris or rubbish likely to promote development of mould fungi. Sanitation in the packing shed is absolutely essential. Two styles of pack are available:—

(1) With cork filler.

(2) Wrapping the bunches in sulphite paper and embedding in wood wool. The cork must be dry, clean and preferably sterilized. The second style is extensively practised in South Africa. It is much the cheaper of the two, and was tried here with satisfactory results last season. Our experience of it is, as yet, too limited to pronounce definitely as to its real value.

7. *Pre-cooling.*—After packing, the grapes should go into cool store as soon as possible; there to await loading on the steamer. This greatly retards drying out of the stalks.

A HARMFUL WEED.

SALSAFY (*Tragopogon porrifolius* L.).

By P. F. Morris, National Herbarium of Victoria.

Though the plant Salsafy was recorded as a naturalized alien in Victoria as far back as 1887, it is only during recent times that its spread has given cause for any concern. No doubt, in the first place, it spread from house gardens by its buoyant seed being carried in the wind. During December, its last blossoming period, it was recorded as growing wild and giving trouble in twelve localities.

Salsafy, which belongs to the order Compositae (thistle family), is native to South Europe, whence it spread to England, North and South America, and Asia. In parts of America, as in some districts in Victoria, it is regarded as a harmful weed.

Here the plant has several common names, being known in different districts as Noon-plant (because it is said to close at noon), Vegetable Oyster, Garden Salsafy, Purple Goat's Beard, Joseph's Flower, and Jerusalem Star.

CHARACTERISTICS.

The leaves are grass-like, from 8 to 12 inches long at the base, smooth and green, clasping the stem and narrowing like a blade of grass.

The flower head has eight green bracts, with many florets of a violet-blue or purple colour. The seed or achene is long and beaked, covered with tubercles on the ribs or merely roughened, light straw-coloured, with a scar at the end. The seed is surmounted by an ariole or stem connecting with a feathery pappus or seed down of many rows. The plant grows to a height of from 1 to 3 feet according to situation.

It has a long boring root, full of milky juice. This is by some regarded as a tasty vegetable; indeed, in parts of France it is considered a delicacy, and a few hold the belief that it is useful as an aid to indigestion. The root may be cooked in the same manner as is a parsnip, which it somewhat resembles. The young leaves are sometimes used for salads. The plant has a slight value as a stock food.

The root is a short-lived perennial, capable of reproducing new plants for about three years. It is spread mainly by seed; plants may flower twice in the same year.

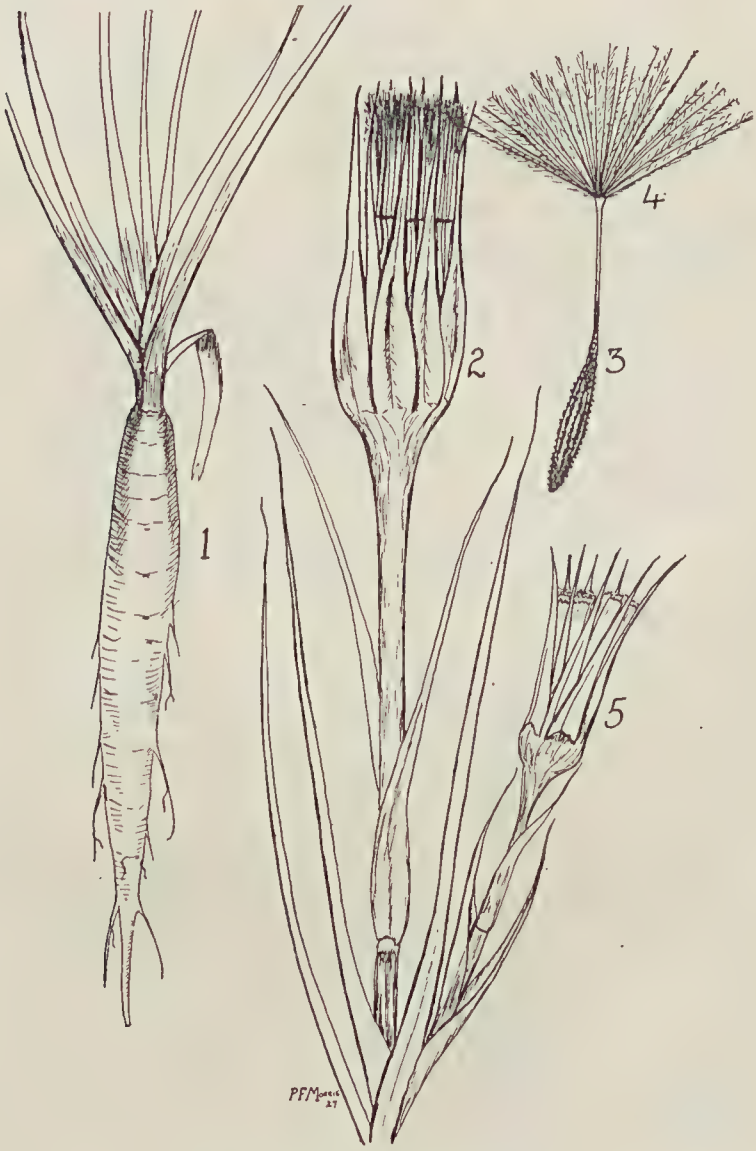
SUGGESTIONS FOR CONTROL.

Salsafy must be regarded as a weed, because it takes up space that should be occupied by more useful plants, and robs those in its immediate vicinity of food and moisture. Another reason why it should be eradicated is that its fluffy seed heads, if eaten by stock in quantity, may cause impaction.

The kind of treatment best adapted to a particular situation depends on the extent of infestation and class of soil:—

1. Small patches should be hand-dug or pulled when the soil is soft after rain.

2. The plant should not be allowed to flower. Cutting will prevent an increase of seedlings, which should be hoed out as they appear. Pigs are very fond of the nutritious roots, and if the soil is loosened they will soon " nose " them out.



Salsafy (*Tragopogon porrifolius* L.).

1. Young plant showing cultivated root—natural size.
2. Flower head approaching seed stage.
3. Achene or seed.
4. Pappus or seed down.
5. Young flower head.

SYDENHAM WHEAT CROP COMPETITION.

Report by the Judge, R. L. Twentyman, B.Agr.Sc., Science Field Officer.

The Sydenham district produces annually large quantities of prime oaten hay for the Melbourne market, but since the demand for hay has been greatly reduced during recent years, farmers have been seeking a more profitable crop. On this account interest in wheat-growing has been greatly stimulated.

Owing to the last three years having been abnormally dry, the wheat has been subjected to very severe conditions which have again demonstrated that it is better able to withstand the dry conditions than is oaten hay.

Despite the exceptional dryness experienced this year, the crops in the competition should generally give a very fair return; a result no doubt largely due to all of them having been grown on fallowed land. Crops sown on stubble land have amply proved that fallowing is essential for the success of the wheat crop in this district. Experiments carried out at the State Research Farm, Werribee, for the last thirteen years have resulted in wheat after fallow averaging 18 bushels per acre as against 6½ bushels per acre from the plot cropped with wheat each year.

Another noticeable feature of the competition was the heavier yielding of the early-sown crops as compared with the late-sown ones. Crops sown in May and early June made much stronger growth than those sown later. In experiments during the last twelve years at Werribee early-sown wheat has averaged 4 bushels per acre more than late-sown.

As the Research Farm is barely 15 miles south of Sydenham, the results of experiments carried out there in wheat-growing are worthy of careful consideration by farmers in the Sydenham district.

There were nine entries in the competition.

Details of Points Awarded.

BEST 20 ACRES OF CROP.

Competitor.	Crop.	Apparent Yield.	Purity.	Absence of Weeds.	Absence of Disease.	Evenness.	Total Points.
Maximum Points ..	..	**35**	**20**	**15**	**15**	**15**	**100**
F. G. Hercus ..	Currawa ..	28	18	13	14	14	87
J. Excell	Major ..	28	17	13	13	13	84
J. O'Neill ..	Currawa ..	26	17	12	14	14	83
V. G. Butler ..	Major and Free Gallipoli	33	16	12	9	12	82
B. Wright ..	Turvey ..	19	18	14	13	14	78
W. R. Morton ..	Joffre ..	20	18	13	13	12	76
G. A. Butler ..	Major and Free Gallipoli	24	16	11	9	13	73
C. McRae ..	Currawa and Major	15	16	11	13	11	66
H. Howden ..	Currawa and Major	18	9	8	12	10	57

Comments on the Crops.

First place was won by Mr. F. G. Hercus with a good even crop of Currawa almost entirely free from disease and showing very few "strangers." This crop was drilled in June on land fallowed in September; 90 lb. of dry pickled seed and 120 lb. of superphosphate were sown per acre.

Mr. J. Excell's exhibit of Major was placed second. This crop was sown on fallow land with 60 lb. of dry pickled seed and 1 cwt. superphosphate per acre. Owing to a poor germination the crop was rather thin, but heavy stooling had made up for the deficiency of plants. A number of "strangers" were present, as well as a little barley.

Mr. J. O'Neill was third with a short even crop of Currawa, lower in yield than either of the winning or the second crop. It was sown in June with 95 lb. dry pickled seed and 1 cwt. superphosphate on land that had been ploughed during August and September.

Mr. V. G. Butler was fourth with a heavy crop of Major and Free Gallipoli. The Major, which was the main portion of the crop, was badly affected by loose smut, and a little flag smut was also present. Many "strangers" were also noticed.

Mr. B. Wright's entry of Turvey was clean and even, with very few "strangers," but lost points for yield.

Mr. W. B. Morton's crop of Joffre included a section sown with 120 lb. seed per acre. This had proved far too heavy a seeding, and had resulted in weak plants with poorly developed heads.

Mr. C. A. Butler's crop of Major was badly affected by loose smut, and to a lesser extent by flag smut. Numerous "strangers" were also present. A section of 4 acres of Free Gallipoli was free from "strangers" and disease, but included some wild oats. The Free Gallipoli variety is well suited for the Sydenham district.

Owing to the absence of Mr. McRae a poorer crop than his original entry was judged. The crop of Major and Currawa was light in yield and points were lost for "strangers" and weeds.

Mr. H. Howden's entry of Major and Currawa contained a large quantity of barley, and "strangers" were numerous.

The Desirableness of Clean Seed.

One aspect of wheat-growing that has not received the attention it merits in this district is the sowing of good clean seed. Most of the crops contained a rather large amount of barley, and the number of foreign heads or "strangers" was generally high. Loose smut was present to some extent in all the crops judged, and in two of them it was particularly bad. Loose smut is a disease that shows itself at flowering time; the diseased head becomes a mass of black sooty spores that soon blow away and leave only the thin backbone of the ear standing. These spores fall on the young undeveloped grains, and although they enter and infect them, do not interfere with the ordinary growth and development of the seed. The disease is now within the wheat grain, and as ordinary pickling materials for ball smut do not penetrate the grain they are quite ineffective against loose smut.

The best method for the farmer to control this disease is to obtain seed from a crop that is free from the disease. Once the wheat is bagged there is no means of detecting either the presence of loose-smut-infected grains, or of "strangers" But an inspection of a crop previous to harvest readily reveals if the wheat would be suitable to sow as seed.

BOORT CROP AND FALLOW COMPETITION, 1927.

Report of the Judge, P. Ryan, B.Ag.Sc., Inspector of Agriculture.

The past season was the driest experienced at Boort since 1914, and subjected the farming practices of the district to a severe test. Not only was the rainfall during the growing season well below the average, but owing to the prolonged dry spell from the time the fallows were made till seeding time, there was little reserve moisture in the subsoils. As a result the crops exhibited in the competition did not give promise of high yields. Although the autumn rains were much delayed, the germination and early growth were satisfactory, and there was every prospect of good yields until the rains petered out at the critical period at the end of September and early October. The crops on the heavy black soils which in a good year give the heaviest yields were the first to wilt off, as these soils do not withstand the dry spell nearly as well as the red soils, which have a red clay subsoil fairly close to the surface. The rain was very patchy, and within a distance of a mile there was an appreciable difference in the amount of rainfall.

As the season turned out, the missing of even one good shower at the critical time had a noticeable effect on the yield. Marmal received one or two showers which other parts missed, and as a result the crops there were, on the whole, the best in the Boort district.

There was a pleasing absence of disease in the crops, most of which were also free from weeds and undergrowth. The most popular varieties in the district appear to be Ranee, Free Gallipoli, Federation and Yanward. Of these, Ranee appeared to withstand the dry conditions best. This variety is extensively grown under the name of "Indian cross Federation." It was apparently obtained before it was named or properly fixed, as it is showing decided variations. Free Gallipoli had been somewhat badly tipped in a number of cases, but still promised to yield well as there appeared to be a better development of the lower spikelets.

The average rate of seeding was 75 lb. of seed and 91 lb. of super. The rate of seeding varied from 60 to 100 lb. As the season turned out, the lighter seedings in most cases proved best, as when the dry spell came they had produced the thickest crops, particularly on the black soils which wilted quickest.

Results.

In the class for the best 50 acres of crop grown on red soil fallow judged in autumn last there were four entries, and first prize was taken

by Mr. J. Greenman, who had been placed first in the fallow competition. Mr. Greenman's crop of Ranee was, considering the season, a very creditable exhibit. Mr. G. Smith was second with a crop of Free Gallipoli and Ranee.

BEST 50 ACRES OF CROP ON RED GROUND.

Competitor.	Yield.	Type.	Freedom from—		Even-ness.	Total Crop.	Total Fallow.	Grand Total.
			Weeds.	Disease.				
Maximum points ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
J. Greenman ..	25	17	14	14	13	83	87	170
G. Smith ..	20	17	13	14	12	76	83	159
P. Weaver (No. 1)	17	18	14	14	11	74	82	156
P. Weaver (No. 2)	15	17	12	14	11	69	82	151

NOTE.—The points allotted for yield do not represent estimated yield in bushels per acre.

The land on which Mr. Greenman's crop was grown was ploughed the first and second week in July. It was cultivated the first week in August with the springtooth cultivator, and was "combined" in the first and second weeks of October. Early in March the roller was used and was followed with the harrows. The land was again harrowed in the third week of June, and then cultivated with the combine. The crop was sown on 23rd June at the rate of 75 lb. per acre; 80 lb. of super. per acre was used, and the seed was pickled with copper carbonate.

Mr. Smith ploughed his land at the end of July, harrowed it at the end of August, and scarified it with the Wimmera scarifier. It was combined in October and harrowed early in January; it was cultivated again in May and harrowed before sowing.

BEST 50 ACRES OF CROP ON BLACK GROUND.

In the section for heavy soils the first prize was taken by Mr. H. W. Kane with a crop of Yanward. This crop promised to yield much heavier than any other crop in the section, but lost points owing to the presence of a fair amount of hedge mustard.

AWARDS.

Competitor.	Yield.	Type.	Absence of Weeds.	Absence of Disease.	Even-ness.	Total Crop.	Total Fallow.	Grand Total.
Maximum points	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
H. W. Kane	22	18	10	14	13	77	86	163
A. V. Lanyon	17	18	14	14	12	75	83	158
J. D. Rosengrave ..	16	17	13	14	12	72	88	160
F. Poxon (A)	15	17	13	14	11	70	85	155
F. Poxon (B)	15	17	13	14	11	70	85	155
P. Weaver	15	17	14	14	10	70	82	152
G. Smith	12	18	14	14	10	68	83	152
L. Smith	13	18	14	14	10	69	80	149
J. Allen	12	18	14	14	10	68	89	157

Mr. H. Kane ploughed his land at the end of July, scarified it at the end of September and springtoothed it at the end of October. It was springtoothed in June and sown in the third week of June at the rate of 70 lb. of seed and 90 lb. of super. per acre. The seed was pickled with formalin.

Mr. Lanyon ploughed his land in June, harrowed it in August, scarified it in September, springtoothed it in October and harrowed in February. The crop was sown at the end of June with seed at the rate of 60 lb. and super. 90 lb. per acre. The seed was pickled with formalin.

Mr. J. D. Rosengrave ploughed his land in July, harrowed it in September, springtoothed it twice in October and harrowed it in November. It was again cultivated before sowing at the end of July.

Fallow Competition.

Although the season was not favorable for the production of first-class fallows, it was pleasing to note that those exhibited showed a distinct improvement on those shown last year. Owing to the dry weather there were few opportunities to work the fallows, and as a result it was difficult, particularly on the black soils, to obtain a well consolidated seed bed.

RESULTS.

In the section for the best 50 acres of fallow on black ground there were nine entries, and first place was awarded to Mr. F. G. Smith, who was closely pressed by Mr. W. V. Weaver. Both these fallows showed evidence of careful preparation.

BEST 50 ACRES OF FALLOW ON DARK GROUND.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Maximum Points	**25**	**25**	**25**	**25**	**100**
F. G. Smith	22	24	25	23	94
W. V. Weaver	21	24	25	23	93
A. Poxon (B)	22	22	23	23	90
T. H. Lanyon	22	23	23	21	89
J. Allen	20	23	22	23	88
F. Moresi	20	21	23	23	87
A. Poxon (A)	20	22	23	22	87
J. Greenman	20	22	22	22	86
P. Weaver	20	21	22	23	86

Mr. F. G. Smith's land was cultivated with the combine at the end of March, scarified at the end of July, cultivated at the end of September, and harrowed in November.

Mr. W. V. Weaver's land was fallowed in March with the sundercut, cultivated with the springtooth in April, skim-ploughed early in September and combined at the end of September.

Mr. A. Poxon scarified his land in April, again in July and September, and harrowed it in October.

BEST 50 ACRES OF FALLOW ON RED SOIL.

There were 13 entries in this section, and first place was awarded to A. Poxon, and second to J. D. Rosengrave.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Maximum Points	25	25	25	25	100
A. Poxon (A)	22	23	23	23	91
J. D. Bosengrave ..	22	23	23	22	90
T. H. Lanyon	23	22	24	20	89
A. Moresi (B)	23	22	24	20	89
F. Poxon	21	22	23	22	88
A. V. Lanyon	21	22	23	22	88
A. Poxon (B)	23	22	21	22	88
A. Moresi (A)	20	22	23	22	87
J. Greenman	20	22	23	22	87
P. Weaver	20	22	23	22	87
F. Poxon (A)	20	22	23	22	87
A. V. Lanyon (A) ..	20	22	23	22	87

Mr. A. Poxon scarified his winning fallow in April and July, and harrowed it in September and October.

Mr. J. D. Rosengrave ploughed his land in August, harrowed it twice in September, cultivated with the springtooth in October, harrowed after rain late in October, and spike-rolled it in November.

CROP AND FALLOW COMPETITION, QUAMBATOOK, 1927.

Report of the Judge, P. Ryan, B.Ag.Sc., Inspector of Agriculture.

Crop Competition.

The favorable impression of the farming methods of the Quambatook district formed when judging the fallows last autumn was confirmed by an inspection of the crops entered in the local competition. The rainfall from the time the fallows were broken until seeding time was scanty, and made the conservation of moisture very difficult. The autumn rains were much delayed, and sowing did not take place till the end of June and the beginning of July. The rainfall between seeding and harvest time was less than 5 inches, a good deal of which came in light showers which were not of great value to the crops. Nevertheless several of the competition crops were estimated to yield more than 5 bags to the acre, while on some of the farms inspected, notably those of Messrs. J. Baird and R. Hammonds, were noticed crops which promised to yield even higher, but were not included in the competition as the fallows had not been entered last year.

The crops on the stretch of country known as the Cannie ridge were particularly good. The soil here is a sandy loam with a red clay sub-soil, and crops yielded much better than those on the heavy black soils. As was pointed out in the report on the fallow competition, these soils present quite distinct problems, and, while the competitors on the red soil had the advantage this year, in a good season the position would

be reversed. The society has recognized this, and next year's competition will be divided into two sections, one for each class of soil.

The average rate of sowing was 76 lb. of seed and 96 lb. of super per acre. There were no wide variations in the rate of manuring, but the rate of seeding ranged from 60 lb. to 100 lb. per acre.

An interesting feature was noticed in Mr. A. Y. Holt's crop of Bald Early. About 20 acres of this crop was dressed with a mixed fertilizer, while on the remainder 90 lb. of super per acre was applied. There was a very clear line of demarcation between the two portions, and that treated with the mixed manure was estimated to yield at least two bags to the acre less than that on which superphosphate had been used.

A large number of varieties are grown in the district, and the most popular appear to be Ranee, Free Gallipoli, Wannon and Federation. On the whole the seed was of good type, and most of the crops were free from disease, but in one instance Ball Smut was discovered. As this disease can be prevented by careful pickling, there is no excuse for its presence in a competition crop.

There were seventeen entries in the competition for the best 50 acres of crop grown on fallow judged in the autumn, and Messrs. R. Hammonds and C. H. James were placed equal first. Both of these exhibits were highly creditable when the nature of the season was taken into consideration. Mr. Hammonds' crop of Free Gallipoli was estimated to yield slightly heavier than Mr. James' crop of Wannon, but it was not as free from strangers. Mr. James was also third with a crop of Ranee, which was considered equal in every respect to his winning crop except in type. Practically the whole of Mr. James' crops were of the same standard as those entered for the competition, and he is to be congratulated on attaining such uniformly good results in an unfavorable season.

While it would not yield as well as those previously mentioned, Mr. T. W. Doyle's crop deserves special mention. It was sown on heavy black soil, and the way it finished out was proof of skilled and careful fallowing.

RESULTS—BEST 50 ACRES OF CROP ON FALLOW.

Competitor.	Yield.	Trueness to Type.	Absence of Weeds.	Absence of Disease.	Evenness.	Total Crop.	Total Fallow.	Grand Total.
Possible Points ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
C. H. James, No. 1	29	19	14	14	13	89	90	179
R. Hammonds ..	30	17	14	14	14	89	84	173
C. H. James, No. 2	29	18	14	14	13	88	86	174
J. B. Mann ..	26	18	14	14	14	86	82	168
T. W. Doyle ..	23	18	14	14	12	81	95	176
P. G. Hoskins ..	23	18	13	14	12	80	83	163
E. Pengelly ..	23	18	13	14	12	80	89	169
R. Williamson ..	23	17	13	14	12	79	81	160
B. Ryan, No. 1 ..	22	18	12	14	13	79	87	166
S. J. Dunstan ..	21	18	13	14	12	78	85	163
J. Baird ..	23	17	11	14	12	77	83	160
A. Y. Holt ..	20	18	14	14	11	77	82	159
J. A. Fawcett ..	18	18	13	13	12	74	86	160
G. Knight ..	17	17	14	14	10	72	95	167
W. Murdoch ..	16	18	14	14	10	72	93	165
B. Ryan, No. 2 ..	19	18	13	10	12	72	84	156
R. Coghlan ..	16	17	12	14	11	70	81	151

The land on which Mr. James' crop was grown was scarified in the middle of June and cross-scarified with the harrows attached during the same month. It was cultivated four times during the spring, combined at the end of October, harrowed in the middle of January, cultivated in May, combined with harrows attached at the end of June. Seventy-five lb. of seed and 1 cwt. of super were sown per acre, and the seed was pickled with copper carbonate.

Mr. Hammonds ploughed his land at the end of April, harrowed it during the third week in June; it was skim-ploughed the last week in June, cross-harrowed the second week in July, harrowed the third week in August, spring-toothed the last week in September, harrowed the second week in October, the fourth week in December, and again the second week in January. It was spring-toothed after the first rain, and harrowed immediately. The crop was sown with the combine at the rate of 75 lb. of seed and 75 lb. of super, the seed being pickled with formalin. The crop was harrowed after it was up.

The land on which Mr. James' crop of Ranee was grown was cultivated in the same way as that on which his first crop was grown; the rate of sowing was also the same.

Fallow Competition.

In the section for fallows on black soils there were twelve entries. On account of the dry season it was difficult to conserve moisture and also to bring about a well-consolidated seed-bed. The absence of this latter was the most marked defect of the fallows, and must seriously militate against the success of the crops should next year prove dry. First prize was awarded to Mr. A. Schlitz, and second to Mr. H. H. Knight.

RESULTS—BEST 50 ACRES OF FALLOW ON BLACK SOIL.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Possible points	**25**	**25**	**25**	**25**	**100**
A. Schiltz	23	24	25	22	94
H. H. Knight	23	23	25	22	93
F. P. Doyle	22	23	25	22	92
P. G. Hoskins	22	23	25	22	92
S. J. Dunstan	23	22	25	22	92
T. W. Doyle	21	24	25	22	92
W. Murdoch	20	23	25	22	90
H. H. Knight, No. 2 ..	21	22	25	22	90
F. Grass	20	23	25	21	89
R. L. Manuel	22	21	25	20	88
J. Ritchie	22	22	22	21	87
P. S. Rowling	21	22	24	20	87
G. Knight	20	20	25	21	86

Mr. Schlitz's fallow was spring-toothed in March and then harrowed. It was scarified in August, spring-toothed at the end of September, and harrowed early in October.

Mr. H. H. Knight's fallow was combined, with harrows attached, in March, scarified in July, harrowed twice in September, and combined with harrows attached in October.

Fallows on Red Soil.

There were eight entries in this section, and first place was taken by Mr. A. N. Gross, with Mr. C. H. James second.

RESULTS—BEST 50 ACRES OF FALLOW ON RED SOIL.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Possible Points	25	25	25	25	100
A. N. Gross	22	23	25	22	92
C. H. James	21	23	25	22	91
J. A. Fawcett	23	21	23	23	90
E. Pengelly	22	21	25	21	89
W. J. Hoskins	20	23	24	21	88
A. Y. Holt	21	22	24	21	88
J. B. Mann	20	21	25	22	88
A. N. Gross, No. 2	20	22	25	21	88
J. B. Hosking	20	21	25	21	87

Mr. A. N. Gross summer fallowed his land in March with the sundercut, scarified it at the end of June, harrowed it at the beginning of September, combined it at the end of September, and harrowed it in October.

Mr. C. H. James' fallow was ploughed early in June, harrowed immediately, harrowed at end of August, combined with harrows attached in September, and cross-combined with harrows attached in October.

KERANG CROP COMPETITION, 1927.

Report of the Judge, J. E. Harrison, B.Ag.Sc., Science Field Officer.

Like other northern districts, Kerang has suffered an adverse season for wheat-growing. A good germination of seed had been secured in late autumn and crops looked promising until September and October, when lack of rain at this critical period caused a partial failure of many crops. In spite of their adversities, however, growers loyally stood by the competition and kept alive the spirit of friendly rivalry and progress.

Results.

Name.	Yield.	Trueness to Type.	Absence of Weeds.	Absence of Disease.	Evenness	Total.
Possible Points ..	35	20	15	15	15	100
Manuel, E. O. (No. 1) ..	24	18	13	11	14	80
Fenton, J. W. ..	18	18	11	12	15	74
Kendall, T. A. ..	12	20	14	13	15	74
Manuel, E. O. (No. 2) ..	18	18	12	11	14	73
Hallinan, J. M. ..	18	17	11	14	13	73
Shipp, R. G. ..	12	18	14	14	14	72
English, W. A. ..	12	18	14	13	14	71
Robinson, H. F. ..	9	19	14	13	15	70
Shipp, R.	9	18	14	15	14	70
Robinson Bros. ..	12	15	14	14	13	68
English, V.	9	16	12	14	14	65

NOTE.—The points allotted for yield do not necessarily represent the estimated yield in bushels per acre.

General Comments on the Competition.

Highest points were awarded to Mr. E. O. Manuel for a field of about equal proportions of Penny and Ford. The latter is a South Australian variety which Mr. Manuel holds in favour as an early wheat. Unfortunately, a little ball smut was apparent in this variety. It is emphasized that if any standard method of pickling is properly carried out this disease is controllable, but care is necessary in carrying out the pickling process to the exact letter. This crop was the heaviest inspected, and Mr. Manuel is to be complimented on obtaining such a good crop in an adverse season.

Mr. Fenton's crop of Penny secured second place. The yield was satisfactory for the year, but the crop was spoilt by the presence of barley, which must be regarded as a weed in a wheat crop. A 3½-inch drill was used in sowing, and the drilling had been very well done. Mr. Fenton obtained full points for evenness.

A "Penny" crop, very true to type, but light in yield, was exhibited by Mr. T. A. Kendall. The drilling had been well done and showed good workmanship. The crop was reasonably free from weeds, but traces of disease were found.

Mr. Manuel's second entry of Steinwedel and Penny was lighter in yield and contained more weeds than the first entry; otherwise they were much the same.

Mr. J. M. Hallinan presented a very interesting exhibit containing four varieties of wheat. It appears to be inevitable on the farm that when a number of varieties are sown some mixing of the seed takes place. This had happened with Mr. Hallinan's, and he lost points accordingly. Of special interest was the freedom from weeds of "Ford," an early wheat, as compared with Yandilla King, a late wheat.

Mr. R. G. Shipp exhibited a crop of Penny wheat. As it had looked so hopeless at the flowering stage, Mr. Shipp said that he had turned his horses on it for a week. It had, however, finished well for the season.

Mr. W. A. English exhibited a field of Bald Early, Improved Gallipoli, and Hard Federation on new land still occupied by numerous pine trees. It contained very few weeds, but in the Hard Federation growing on the heavier flat land in the field flag smut was present. With the following exception, the varieties were true to type. A drill width of one wheat had been sown at right angles across other varieties. As this had been done near a headland the varieties could be harvested without mixing, and Mr. English was treated leniently.

Mr. R. Shipp's crop of Federation had been well put in. It was almost free from weeds and disease.

Messrs. Robinson Bros.' exhibit was spoiled by the mixing of varieties, and a similar criticism must be made of Mr. V. English's crop. In other respects these exhibits were fair for the season. The freedom from wild oats of Mr. English's crop deserves special mention. He attributes this to the use of sheep, which he declares makes it an easy matter to keep a fallow clean.

Pickling.

In order to obtain a crop free from ball smut, it is wise first to secure seed from a clean crop. If this is pickled by a standard method,

prevention is made certain. The various standard methods are well known, but growers are reminded of the following points:—

Correct strength for formalin solution is 1 pint in 40 gallons.
Correct strength for bluestone solution is 1½ lb. in 10 gallons.
The solution being used for pickling must not be replenished with water, but with solution of the correct strength.
Copper carbonate should be used at the rate of 2 oz. per bushel.
Dry pickling demands even more care than wet pickling.
Only new bags, or bags that have been treated with pickle, should be used for pickled seed.

Drilling.

It is not uncommon to see wide misses in a wheat crop, or, more important still, too wide a space between drill widths. Some use may be made of the vacant ground by adjacent wheat plants but more often it is a harbour for weeds. It becomes then a matter of proportion how much is lost. For example, if one hoe in thirteen is missed, it is equivalent to missing one bushel in thirteen, one acre in thirteen, or £1 in £13. In addition, weeds are fostered, and shed their seed for subsequent growth. Good drilling is a matter for pride and economy.

Trueness to Type.

In the case of farmers' crops, this refers to the purity of the variety. For example, a crop of Federation should be all Federation, and nothing but Federation. Many growers contend that for farm seed a little mixing does not matter, as the yield is not affected. In the case of a mixed crop, however, the different varieties are often to be seen at various stages of maturity, and to be of different heights, two points which affect the harvesting of a crop. By a wider view of the case, a variety must be kept pure because it has been developed on account of a desirable character that distinguishes it from other wheats. It may be suited to a particular soil, climate, or purpose; and mixing means deterioration in the seed sample in this very quality.

Care in the use of harvester, grader, bags, and drills is necessary to keep a seed sample true to type.

WIMMERA CULTURAL METHODS.

Interesting Tests at Longerenong.

The possibility of still further increasing the efficiency of wheat-growing methods in the Wimmera and improving on the already high yields obtained by growers in that province is indicated in a report recently submitted to the Minister of Agriculture, Mr. Slater, by the Superintendent of Agriculture, Mr. H. A. Mullett. This report deals with the results of the cultivation tests carried out by the Department at Longerenong Agricultural College, in the Horsham district, and which aroused so much interest among the wheat-growers who attended the field day held there just prior to harvest. The results are of particular interest, in view of the dry season experienced, the total rainfall for the year at Longerenong amounting to only 9.75 inches compared with the normal annual rainfall of 17 inches.

The experiments consist of 20 different methods of cultivation. These plots, which were sown with Federation wheat, serve to demonstrate the remarkable efficiency of certain methods of cultivation in dry years, and, if the results of one year's work can be accepted as a guide, show that still further advances are possible in the application of scientific methods to the raising of the yields of wheat crops in these districts.

In his report, Mr. Mullett points out that the yields of the various plots ranged all the way from 3.5 to 34.75 bushels per acre, the best yield being obtained on summer fallowed land, the crops on which averaged exactly 10 bushels an acre more than those on winter fallow. The worst yields were on late fallow, and also where the mulching of the fallow had been neglected. The standard practice in the Wimmera is to fallow in July to 3½ inches deep and to maintain a loose dust mulch of about 2 to 2½ inches. These tests appear to indicate, however, that where the land is suitable, deeper ploughing and deeper mulching may be one direction in which a substantial advance in yield may be obtained, though the results in this connexion must be accepted with caution, as it will be necessary to confirm them by additional work.

The plots were each one quarter of an acre in area, and were sown with Federation wheat at the rate of 75 lb. per acre with 1½ cwt. of 22 per cent. super. The seed was pickled dry with copper carbonate powder. The yields obtained were as follow:—

Treatment of Plot.	Yield per Acre.
1. Ploughed April 3½-in., scarified end July to 3½-in., worked standard manner	31·9 bushels
2. Ploughed April 5-in., scarified end July to 3½-in., worked standard manner	30·1 „
3. Ploughed April 6½-in., scarified end July to 3½-in., worked standard manner	26·1 „
4. Disced April 3½-in., scarified end July to 3½-in., worked standard manner	30·2 „
5. Scarified April 3½-in., ploughed end July to 3½-in., worked standard manner	30·7 „
6. Spring-toothed April 2-in., ploughed end July to 3½-in., worked standard manner	32·3 „
7. Ploughed April 3½-in., scarified end July to 3½-in., worked to 3½-in. mulch	31·0 „
8. Ploughed April 5-in., scarified end July to 3½-in., worked to 3½-in. mulch	34·7 „
9. Ploughed April 3½-in., scarified end July to 3½-in., standard treatment	32·1 „
10. Ploughed May 3½-in., scarified end July, standard treatment	31·4 „
11. Ploughed July 3½-in., scarified end August to 2½-in., standard treatment	21·6 „
12. Ploughed July to 3½-in., scarified end August to 3½-in., worked to 3½-in. mulch.	21·7 „
13. Ploughed July 5-in., scarified August to 5-in., worked to 5-in. mulch	20·8 „
14. Ploughed July 5-in., scarified August to 2½-in., standard treatment	20·1 „
15. Ploughed July to 6½-in., scarified August to 2½-in., standard treatment	19·6 „
16. Ploughed July to 3½-in., scarified August 2½-in., standard treatment, but disced deeply and dry in January	21·6 „
17. Ploughed July 3½-in., scarified August 2½-in., then standard treatment but worked knife-bar dry in January	23·5 „
18. Ploughed October 3½-in., scarified November 2½-in., standard treatment	19·9 „
19. Ploughed June 3½-in. (stubble crop)	3·5 „
20. Ploughed July 3½-in., scarified August 2½-in., not cultivated, sheeped till seeding	8·1 „

In the above the "standard treatment" given was as follows:—The fallow was sheeped in spring, scarified August and September 2½ inches deep, and then harrowed. It was worked subsequently with the spring-tooth and harrows after rain, then scarified and harrowed twice before seeding.

In his report Mr. Mullett further states that for some years past the practice of summer fallowing has been advocated strongly by the Department to Wimmera growers whose land is suitable. The results of comprehensive tests conducted by the Nhill A. and P. Society have confirmed the departmental views in this regard. The Longerenong tests now afford fresh evidence in this direction, and show how outstanding the value of summer fallowing is in dry years. With regard to the depth of ploughing the trials would appear to suggest that, while very deep ploughing is detrimental, it might be desirable for farmers to test on small areas the effect of slightly deeper ploughing than is now the practice. Where this is done it would be advisable to establish the mulch a little deeper than usual, say to 3 inches. One or two leading farmers in the Wimmera have been cautiously experimenting in this direction, and the results they have obtained appear to confirm the work of the Department. It is recognized, however, that some of the soils are so shallow that deeper ploughing than is at present employed cannot be recommended owing to the danger of bringing sour sub-soil to the surface. One interesting feature of the experiments was the beneficial effect of employing a knife-bar attached to the scarifier for summer working as opposed to the use of heavier implements such as the disc. The result of this experiment was in conformity with local experience.

A revolutionary practice sometimes advocated was that, on the black soils, sheep could be used to supersede cultivating implements owing to the fact that they consumed all weed growth and, at the same time, maintained a fair degree of tilth on the surface. The results of the tests showed most markedly that, if adopted in dry years, this method might result in practically complete failure. The yield of the plot so treated at Longerenong was only 8 bushels per acre, whereas the average of those on well-worked winter fallow was about 20 bushels and those on summer fallow 30 bushels an acre. The crop on non-fallow yielded only 3½ bushels per acre.

Mr. Mullett again emphasized that, owing to the newness of these experiments, the results should be accepted with caution, but it was felt that, as the differences were so outstanding, they should be communicated to the farming community.

VALENCIA LATE ORANGES.

COLOURING BY ETHYLENE GAS.

By G. B. Tindale, B.Ag.Sc.

The use of ethylene gas for colouring citrus fruits and tomatoes has become quite a common practice in the United States of America, and this season experiments were carried out at the Government Cool Store, Melbourne, to test the process under our conditions. The experiments were interesting, in so far as they indicated that under certain conditions the gas may be of great assistance to the citrus-grower. On the other hand, if these conditions do not prevail, then little success can be hoped for.

The experiments showed that with Valencia Late oranges which are mature, but have turned green again owing to irrigation or unfavorable weather conditions, the gas will change the dingy green to a bright yellow, provided that a suitable range of temperatures prevails in the gas box. But there is little chance of success when the fruit is immature, and even excessive applications of the gas failed to produce a colour beyond that of a dingy yellow.

This is indeed somewhat fortunate, for it prevents unscrupulous people from colouring immature fruit and exposing the same for sale as being mature.

The actual process of colouring is very simple. A gas-proof box is required with a close-fitting door. The box can conveniently be 6 feet high so that a man may be able to enter it to stack the cases. A small hole should be made so as to insert a thermometer, which could be placed in such a way that the bulb is within the box, while the mercury column is without, so making temperature recording a simple process. The temperature required is between 75 deg. and 85 deg. F., and in order to secure and maintain this in our experiments a four-bulb electric radiator was placed inside the box. This was controlled by an external switch.

The concentration of ethylene required is 1 cubic foot of gas per 1,000 cubic feet of space, and although this mixture is not explosive, yet should the mixture by accident become a rich one, there is a risk from naked flames. Thus the heating apparatus, to secure a satisfactory temperature, should be of such a type that there is no free flame.

In many parts of Victoria there is little difficulty in naturally maintaining the range of temperatures required for the colouring.

The gas is contained in a small portable cylinder, to which is attached a measuring gauge; this measures the number of cubic feet of gas passing per minute. The gas enters the box through a rubber tube which joins the measuring gauge to a small tap leading into the box.

The correct amount of gas should be applied at not less than eight-hour intervals. Under the most favorable conditions in the recent experiments, we were able to colour up mature but green Valencia Late oranges after six applications.

The gas used for the experiments was kindly supplied by the Australian Oxygen and Industrial Gases Company, Latrobe-street, Melbourne, while we were indebted to Messrs. P. Rossiter, of Cobram, and F. MacMullen, Bamawm, for the fruit required.

ARTIFICIAL FERTILIZERS REGISTERED FOR 1928

(as required by the Fertilizers Act 1915).

The Artificial Fertilizers Act imposes certain obligations on the manufacturer and importer of artificial fertilizers. Among the most important are—(*a*) registration of brands; (*b*) supplying invoice certificates on sale of a brand of fertilizer; and (*c*) labelling of every package.

What is a Fertilizer.

The definition under the Act is any material containing nitrogen, phosphoric acid, or potash, which has been manufactured, prepared, or produced in any manner for the purpose of fertilizing the soil or supplying nutriment to the plant, but does not include farm-yard or stable manure, or any crude night soil, crude offal, or other unmanufactured refuse.

Registration of Brands.

All manufacturers or importers of fertilizers who intend offering for sale any such material as above defined, shall, on or before the first day of November in each year, make an application to the Director of Agriculture for the registration of a brand for each of such fertilizers. All applications must set forth, on the prescribed form, the name and place of business of the applicant, the brand to be associated with the fertilizer, and an analysis of the fertilizer, stating the percentage of each fertilizing ingredient, and the respective form or forms in which they occur, and the retail price per ton of the fertilizer at headquarters.

Invoice Certificate.

If not at time of sale, then before delivery of any fertilizer, the vendor shall give the purchaser an invoice certificate in the form prescribed by the Act, stating the name of the seller, the name of the buyer, the weight purchased, the name and brand of the fertilizer, and the percentage of nitrogen, phosphoric acid, and potash, and the forms in which they occur in the fertilizer. It is essential that the purchaser should not only obtain but keep the invoice certificate covering each lot of fertilizer purchased, it being the seller's guarantee of the fertilizer sold, and in the case of any dispute as to quality the production of the invoice certificate is essential.

Labelling.

Every parcel of fertilizer sold should have a plainly printed label securely affixed to such parcel, showing clearly and truly the name of manufacturer, the registered brand, the analysis stating the percentage of nitrogen, phosphoric acid, and potash, and the respective forms in which they occur in the fertilizer, and the nett weight of the fertilizer in the parcel.

Unit Values.

The unit value is the value of 1 per cent. of nitrogen, phosphoric acid, or potash in one ton of fertilizer.

The unit value may serve a useful purpose if put into application. The value of any brand can be calculated only on the fertilizer constituents guaranteed by the vendor. To apply the unit values, the buyer must first ascertain what the seller guarantees, and by multiplying the percentage of the ingredient by the unit value given in table for the form in which it is present, he will be able to arrive at its commercial value.

By way of illustration the following examples are given:—

Blood and Bone Fertilizer.

Guaranteed to contain—								
Nitrogen as blood and bone								5.47%
Phosphoric acid, citrate soluble								5.44%
Phosphoric acid, citrate, insoluble								8.10%
Phosphoric acid, total								13.54%
Nitrogen as blood and bone, unit value								£1 3 3
Phosphoric acid as citrate soluble, unit value								0 5 6
Phosphoric acid as citrate insoluble, unit value								0 5 0
Percentage of Constituent x Unit Value.								
Nitrogen	5.47%	x	£1	3	3	=		6 7 3
Phosphoric acid	5.44%	x	0	5	6	=		1 9 11
Phosphoric acid	8.10%	x	0	5	0	=		2 0 6
Value per ton								£9 17 8

Bonedust.

Guaranteed to contain——								
Nitrogen as bone								3.73%
Phosphoric acid								19.50%
Mechanical condition—								
Fine bone								38.50%
Coarse bone								61.50%
The nitrogen as fine bone	3.73%	x	38.50			=		1.43%
The nitrogen as coarse bone	3.73%	x	61.50			=		2.30%
The phosphoric acid as fine bone	19.50%	x	38.50			=		7.50%
The phosphoric acid as coarse bone	19.50%	x	61.50			=		12.00%
Nitrogen as fine bone, unit value								£1 3 3
Nitrogen as coarse bone, unit value								1 0 0
Phosphoric acid as fine bone, unit value								0 5 6
Phosphoric acid as coarse bone, unit value								0 5 0
Percentage of Constituent x Unit Value.								
Nitrogen as fine bone	1.43	x	£1	3	3	=		£1 13 3
Nitrogen as coarse bone	2.30	x	1	0	0	=		2 6 0
Phosphoric acid as fine bone	7.50	x	0	5	6	=		2 1 3
Phosphoric acid as coarse bone	12.00	x	0	5	0	=		3 0 0
Value per ton								£9 0 6

Fertilizers Act 1915.

LIST OF UNIT VALUES FOR THE YEAR 1928.

	£	s.	d.
Nitrogen, as Blood .. .. per unit			
,, as Blood and Bone .. .. ,,	1	3	3
,, as Blood and Flesh .. .. ,,			
,, as Fine Bone .. .. ,,			
,, as Coarse Bone .. .. ,,	1	0	0
,, as Urea .. .. ,,	0	19	7
,, as Nitrate .. .. ,,	0	19	4
,, as Ammonia .. .. ,,	0	15	9
Phosphoric Acid—			
as *Water Soluble* .. .. ,,	0	4	10
as *Citrate Soluble*—			
in Blood and Bone .. .. ,,			
in Animal Fertilizers .. .. ,,			
in Bone Fertilizers .. .. ,,	0	5	6
in Bone and Lime .. .. ,,			
as Fine Bone .. .. ,,			
in Blood, Bone, and Super .. .. ,,			
in Bone and Super .. .. ,,			
in Super and Bone .. .. ,,	0	5	0
in Market Garden Manures .. .. ,,			
in Complete, No. 3 and No. 4 .. .. ,,			
in Cresco No. 2, mixed .. .. ,,			
in other Fertilizers .. .. ,,	0	4	10
as *Citrate Insoluble*—			
in Blood and Bone .. .. ,,			
in Animal Fertilizers .. .. ,,	0	5	0
as Coarse Bone .. .. ,,			
in Bone Fertilizers .. .. ,,			
in Blood, Bone, and Super .. .. ,,			
in Bone and Super .. .. ,,			
in Super and Bone .. .. ,,	0	3	10
in Market Garden .. .. ,,			
in Complete, No. 3 and No. 4 .. .. ,,			
in Cresco No. 2 .. .. ,,			
in Super and Phosphate .. .. ,,			
in Basic Phosphate .. .. ,,			
in Ammonia and Phosphate .. .. ,,	0	2	9
in Mixed Cresco .. .. ,,			
in Phosphatic Guano and Super .. .. ,,			
in other Fertilizers .. .. ,,	0	1	0
Potash, as Sulphate .. .. ,,	0	5	9
,, as Muriate (or Chloride) .. .. ,,	0	4	10

P. RANKIN SCOTT,
Chemist for Agriculture.

7th December, 1927.

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928.

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Nitrogenous, Readily Soluble.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Nitrate of Soda ..	Cresco	15·00	..	..	..	..	15·00	..	..	..	..	..	16 0 0	Cresco Fertilizers Ltd., North Geelong
,, ,, ..	Sickle	15·50	..	..	..	..	15·50	..	..	..	..	..	15 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond	15·50	..	..	..	..	15·50	..	..	..	..	..	15 0 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, S.N. ..	15·50	..	..	..	..	15·50	..	..	..	..	..	15 0 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	15·50	..	..	..	..	15·50	..	..	..	..	..	15 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Sulphate of Ammonia ..	Cresco	..	20·00	..	..	..	20·00	..	..	..	..	..	17 0 0	Cresco Fertilizers Ltd., North Geelong
,, ,, ..	Sickle	..	20·00	..	..	..	20·00	..	..	..	..	..	15 15 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	M.G. Co., in diamond	..	20·59	..	..	..	20·59	..	..	..	..	..	15 5 0	The Metropolitan Gas Co., Flinders-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond	..	20·00	..	..	..	20·00	..	..	..	..	..	15 15 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, A.S. ..	..	20·00	..	..	..	20·00	..	..	..	..	..	15 15 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	20·00	..	..	..	20·00	..	..	..	..	..	15 15 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Urea	BA over SF, in circle..	..	..	..	.. ..	.. ..	46·00 (as Urea)	..	..	..	..	..	45 0 0	Dyes and Chemicals (Aust.) Ltd., 573–585 Lonsdale-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Nitrogenous continued. *Moderately Soluble.*		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood Manure	Cockbill's	..	..	8·50	..	..	8·50	..	..	1·00	1·00	..	8 10 0	J. Cockbill, 407 Post Office-place, Melbourne
,, ,, ...	Sickle	..	..	7·50	..	..	7·50	..	..	..	..	..	9 5 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ...	M.C.C. in diamond ..	..	..	7·90	..	..	7·90	..	..	1·13	1·13	0·60	7 5 0	Melbourne City Council Desiccating Works, Smithfield-road, Flemington
,, ,, ...	Mt. Lyell, M.L. in diamond	..	..	7·50	..	..	7·50	..	..	..	..	..	9 5 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ...	Federal	..	..	7·50	..	..	7·50	..	..	..	..	..	9 5 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ...	Wischer and Co. Pty. Ltd.	..	..	7·50	..	..	7·50	..	..	..	..	..	9 5 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ...	Pannifex's ..	..	..	11·00	..	..	11·00	..	..	0·50	0·50	1·10	16 0 0	H. C. Pannifex and Co., 26 Market-street, Melbourne
Dried Blood	Imperial, in diamond	..	..	11·75	..	..	11·75	..	..	0·75	0·75	0 50	12 0 0	W. Angliss and Co. Pty. Ltd., 42 Bourke-street, Melbourne
Phosphatic. Readily Soluble.														
Superphosphate ..	Cresco, 24% ..	..	..	..	..	..	..	22·00	0·50	1·50	24·00	..	5 10 0	Cresco Fertilizers Ltd., North Geelong
,, ..	Sickle, Florida, 24% ..	..	..	..	..	..	..	22·00	0·50	1·50	24·00	..	5 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ..	Mt. Lyell, M.L. in diamond, 24%	..	..	..	..	..	..	22·00	0·50	1·50	24·00	..	5 10 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Federal, 24% ..	..	..	..	..	..	..	22·00	0·50	1·50	24·00	..	5 10 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.			Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.		£	s.	d.	
Phosphatic—Readily Soluble continued.		%	%	%	%	%	%	%	%	%	%	%				
Superphosphate ..	Wischer and Co. Pty. Ltd., 24%	..	..	..	..	..	..	22·00	0·50	1·50	24·00	..	5	10	0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ..	Cockbill's, 22% ..	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	J. Cockbill, 407 Post Office-place, Melbourne
,, ..	Cresco, 22% ..	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	Cresco Fertilizers Ltd., North Geelong
,, ..	Sickle Florida, 22% ..	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	Cuming, Smith, and Co. Pty Ltd., 65 William-street, Melbourne
,, ..	Mt. Lyell, M.L. in diamond, 22%	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ..	Federal, 22% ..	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ..	Pivot	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	The Phosphate Co-op. Co. of Australia Ltd., 440 Little Collins-street, Melbourne
,, ..	Wischer and Co. Pty. Ltd., 22%	..	..	..	..	..	..	20·50	0·50	1·00	22·00	..	5	5	0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Moderately Soluble.																
Super and Phosphate ..	Sickle	..	..	..	..	..	..	10·25	1·50	19·25	31·00	..	5	7	6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond, 30%	..	..	..	..	..	..	10·25	1·50	19·25	31·00	..	5	7	6	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, 30% ..	..	..	..	..	..	..	10·25	1·50	19·25	31·00	..	5	7	6	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd., 30%	..	..	..	..	..	..	10·25	1·50	19·25	31·00	..	5	7	6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Cresco, 30% ..	..	..	..	..	..	..	10·00	1·50	19·50	31·00	..	5	7	6	Cresco Fertilizers Ltd., North Geelong

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Phosphatic—Moderately Soluble—continued.														
Phosphatic Guano and Super	Cresco	..	..	..	..	..	..	7·30	5·50	10·05	22·85	..	5 5 0	Cresco Fertilizers Ltd., North Geelong
Basic Phosphate ..	Sickle	..	..	..	..	..	..	..	15·50	3·20	18·70	..	5 10 0	Cuming, Smith, and Co. Pty Ltd., 65 William-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond	..	..	..	..	..	..	..	15·50	3·20	18·70	..	5 10 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal B.P. ..	..	..	..	..	..	..	..	15·50	3·20	18·70	..	5 10 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	15·50	3·20	18·70	..	5 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Slowly Soluble.														
Ground Phosphate ..	Cresco, 80% ..	..	..	..	..	..	..	..	..	36·65	36·65	..	4 17 6	Cresco Fertilizers Ltd., North Geelong
„ „ ..	Sickle, 80% ..	..	..	..	..	..	..	..	..	36·65	36·65	..	5 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond, 80%	..	..	..	..	..	..	..	..	36·65	36·65	..	5 0 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Pivot	..	..	..	..	..	..	..	..	36·65	36·65	..	5 0 0	The Phosphate Co-op. Co. of Australia Ltd., 440 Little Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd., 80%	..	..	..	..	..	..	..	..	36·65	36·65	..	5 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
„ „ ..	Federal G.P., 80% ..	..	..	..	..	..	..	..	..	36·65	36·65	..	5 0 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Potassic.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Readily Soluble.														
Muriate of Potash ..	Cresco	..	..	..	..	..	..	..	..	..	..	50·00	12 0 0	Cresco Fertilizers Ltd., North Geelong
„ „ ..	Sickle	..	..	..	..	..	..	..	..	..	..	50·00	11 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
„ „ ..	R.N.	..	..	..	..	..	..	..	..	..	..	53·50	11 10 0	Dalgety and Co. Ltd., 461–471 Bourke-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond	..	..	..	..	..	..	..	..	..	..	50·00	11 10 0	The Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal	..	..	..	..	..	..	..	..	..	..	50·00	11 10 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	..	..	..	50·00	11 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Sulphate of Potash ..	Cresco	..	..	..	..	..	..	..	..	..	..	48·50	14 10 0	Cresco Fertilizers Ltd., North Geelong
„ „ ..	Sickle	..	..	..	..	..	..	..	..	..	..	48·50	14 0 0	Cuming, Smith, and Co. Pty Ltd., 65 William-street, Melbourne
„ „ ..	D. & Co.	..	..	..	..	..	..	..	..	..	..	49·08	14 0 0	Dalgety and Co. Ltd., 461–471 Bourke-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond	..	..	..	..	..	..	..	..	..	..	48·50	14 0 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal	..	..	..	..	..	..	..	..	..	..	48·50	14 0 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd.	..	..	..	..	..	..	..	..	..	..	48·50	14 0 0	Wischer and Co. Pty. Ltd., 491 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand	Nitrogen						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Readily Soluble.														
Super and Ammonia ..	Sickle	..	3·33	..	..	..	3·33	17·08	0·42	0·83	18·33	..	8 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond	..	3·33	..	..	..	3·33	17·08	0·42	0·83	18·33	..	8 0 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal	..	3·34	..	..	..	3·34	17·08	0·42	0·83	18·33	..	8 0 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd.	..	3·33	..	..	..	3·33	17·08	0·42	0·83	18·33	..	8 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Nitro-Superphosphate ..	Sickle	..	1·50	..	0·50	..	2·00	16·39	1·10	1·70	19·19	..	7 2 6	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond	..	1·50	..	0·50	..	2·00	16·39	1·10	1·70	19·19	..	7 2 6	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal, N.S. ..	..	1·50	..	0·50	..	2·00	16·39	1·10	1·70	19·19	..	7 2 6	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd.	..	1·50	..	0·50	..	2·00	16·39	1·10	1·70	19·19	..	7 2 6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Di Ammonium Phosphate	Di-ammon-Phos. I.G. B.A over SF in circle	..	20·60	..	..	..	20·60	52·50	..	..	52·50	..	37 10 0	Dyes and Chemicals (Aust.) Ltd., 573 Lonsdale-street, Melbourne
Moderately Soluble.														
Ammonia and Phosphate	Cresco	..	2·00	..	..	..	2·00	9·60	1·80	16·00	27·40	..	6 15 0	Cresco Fertilizers Ltd., North Geelong
Blood, Bone, and Super..	Cockbill's	..	..	..	2·50	..	2·50	11·18	2·00	5·00	18·18	..	7 10 0	J. Cockbill, 407 Post Office-place, Melbourne
„ „ ..	Sickle	..	..	..	2·50	..	2·50	11·28	1·47	1·18	16·93	..	7 10 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid—Moderately Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood, Bone and Super ..	Mt. Lyell, M.L. in diamond	..	..	..	2·50	..	2·50	11·28	1·47	4·18	16·93	..	7 10 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, B.B.S. ..	..	..	..	2·50	..	2·50	11·28	1·47	4·18	16·93	..	7 10 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	2·50	..	2·50	11·28	1·47	4·18	16·93	..	7 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Bone and Super ..	Cresco	..	..	..	..	2·00	2·00	9·50	3·90	3·00	16·40	..	7 15 0	Cresco Fertilizers Ltd., North Geelong
,, ,, ..	Sickle, mixed "A" ..	..	..	..	..	2·00	2·00	11·01	2·67	5·91	19·59	..	7 15 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond, No. 1	..	..	..	..	2·00	2·00	11·01	2·67	5·91	19·59	..	7 15 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, B.S. No. 1 ..	..	..	..	..	2·00	2·00	11·01	2·67	5·91	19·59	..	7 15 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd., No. 1	..	..	..	..	2·00	2·00	11·01	2·67	5·91	19·59	..	7 15 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Bone Fertilizer and Super	Elsworth	..	..	..	..	1·50	1·50	11·00	2·50	5·00	18·50	..	7 0 0	W. R. Elsworth, cr. York and Joseph streets, Ballarat
Super and Bone ..	Sickle, mixed, "C" ..	..	..	..	1·00	..	1·00	15·75	1·58	3·46	20·79	..	6 15 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond, No. 2	..	..	..	1·00	..	1·00	15·75	1·58	3·46	20·79	..	6 15 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, S.B. ..	..	..	..	1·00	..	1·00	15·75	1·58	3·46	20·79	..	6 15 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd., No. 2	..	..	..	1·00	..	1·00	15·75	1·58	3·46	20·79	..	6 15 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid—Moderately Soluble—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood and Bone ..	Pannifex's B. & B. ..	..	..	..	7·65	..	7·65	..	5·00	7·15	12·15	..	11 15 0	H. C. Pannifex and Co., 26 Market-street, Melbourne
.. .. ..	P. & Co. B. & B. ..	..	..	..	7·17	..	7·17	..	5·00	6·99	11·99	..	11 10 0	,, ,, ,,
.. .. ..	Pannifex's B. ..	..	..	..	6·75	..	6·75	..	5·00	7·00	12·00	..	11 0 0	,, ,, ,,
.. .. ..	Imperial, in diamond	..	..	..	4·75	..	4·75	..	5·00	12·00	17·00	..	9 0 0	W. Angliss and Co. Pty. Ltd., 42 Bourke-street, Melbourne
.. .. ..	Cockbill's	..	..	..	5·50	..	5·50	..	3·00	9·00	12·00	..	10 0 0	J. Cockbill, 407 Post Office-place, Melbourne
.. .. ..	Cresco	..	..	..	5·00	..	5·00	..	3·00	11·50	14·50	..	10 10 0	Cresco Fertilizers Ltd., North Geelong
.. .. ..	Sickle	..	..	..	5·00	..	5·00	..	6·00	10·00	16·00	..	10 10 0	Cuming, Smith, and Co. Pty Ltd., 65 William-street, Melbourne
.. .. ..	King's, Geelong ..	..	..	..	5·00	..	5·00	..	6·90	8·60	15·50	..	9 10 0	Joseph C. King and Sons Pty. Ltd., 36 Little Fyans-street, Geelong
.. .. ..	Eclipse	..	..	..	4·42	..	4·42	..	5·88	8·46	14·34	..	8 0 0	Thomas Albert Mills, Spec Gully, Golden Square
.. .. ..	Mt. Lyell, M.L. in diamond	..	..	..	5·00	..	5·00	..	6·00	10·00	16·00	..	10 10 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
.. .. ..	Federal, B.B. ..	..	..	..	5·00	..	5·00	..	6·00	10·00	16·00	..	10 10 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
.. .. ..	Pridham's ..	..	..	..	4·51	..	4·51	..	6·07	8·53	14·60	..	9 0 0	W. Pridham Pty. Ltd., Evan-street, Braybrook
.. .. ..	Bendigo, Rohs, in circle	..	..	..	6·00	..	6·00	..	5·00	6·00	11·00	..	11 0 0	P. Rohs Pty. Ltd., Bendigo Bone Mills, Grassy Flat, Bendigo
.. .. ..	W. & M. (in circle) ..	..	..	..	6·00	..	6·00	..	4·50	5·50	10·00	..	11 10 0	Western and Murray Co-op. Bacon and Meat Packing Co. Ltd., 522 Flinders-lane, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where Obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen and Phosphoric Acid—Moderately Soluble continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Blood and Bone ..	Wischer and Co. Pty. Ltd.	..	..	..	5·00	..	5·00	..	6·00	10·00	16·00	..	10 10 0	Wischer and Co. Pty. Ltd. 499 Little Collins street, Melbourne
Animal Fertilizer ..	Pannifex's No. 1 ..	..	..	..	..	6·00	6·00	..	5·00	8·00	13·00	..	10 15 0	H. C. Pannifex and Co., 26 Market-street, Melbourne
,, ,, ..	Pannifex's No. 2 ..	..	..	..	..	5·50	5·50	..	5·00	7·00	12·00	..	9 10 0	,, ,, ,,
,, ,, ..	Pannifex's No. 4 ..	..	..	..	..	5·50	5·50	..	5·00	10·00	15·00	..	10 10 0	,, ,, ,,
,, ,, ..	Arc	..	..	..	..	6·00	6·00	..	5·00	7·00	12·00	..	10 10 0	,, ,, ,,
,, ,, ..	Pannifex's A grade ..	..	..	..	..	5·00	5·00	..	5·00	11·50	16·50	..	9 10 0	,, ,, ,,
,, ,, ..	Pannifex's No. 5 ..	..	..	..	..	4·16	4·16	..	4·50	13·00	17·50	..	9 15 0	,, ,, ,,
Bone Fertilizer ..	Sickle	..	..	..	4·00	..	4·00	1·53	4·84	10·83	17·20	..	9 12 6	Cuming, Smith and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond	..	..	..	4·00	..	4·00	1·53	4·84	10·83	17·20	..	9 12 6	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Ark	..	..	..	..	3·50	3·50	..	3·98	12·90	16·88	..	7 0 0	Arthur Murphy, Barkley-street, Ararat
,, ,, ..	Federal, B.F. ..	..	..	..	4·00	..	4·00	1·53	4·84	10·83	17·20	..	9 12 6	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	AN.A. Surprise ..	..	..	..	..	5·00	5·00	..	4·00	12·00	16·00	..	9 10 0	George William Pennell, Braybrook
,, ,, ..	Wischer and Co. Pty. Ltd.	..	..	..	4·00	..	4·00	1·53	4·84	10·83	17·20	..	9 12 6	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Elsworth's ..	..	..	..	..	3·00	3·00	1·50	4·00	9·50	15·00	..	8 0 0	W. R. Elsworth, cr. York and Joseph streets, Ballarat
Bone and Lime ..	Soupol	..	..	..	..	3·00	3·00	..	4·76	7·24	12·00	..	7 10 0	J. A. Dundas, Dynon-road Footscray

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash (as Sulphate).	Price asked per ton	Where Obtainable
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen, Phosphoric Acid and Potash.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Market Garden ..	Sickle	..	1·50	..	1·56	..	3·06	11·65	1·49	3·26	16·40	2·50	8 10 0	Cuming, Smith and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond	..	1·50	..	1·56	..	3·06	11·65	1·49	3·26	16·40	2·50	8 10 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, M.G. ..	..	1·50	..	1·56	..	3·06	11·65	1·49	3·26	16·40	2·50	8 10 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd.	..	1·50	..	1·56	..	3·06	11·65	1·49	3·26	16·40	2·50	8 10 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
Complete Manure ..	Sickle, No. 1 ..	..	2·50	..	..	..	2·50	15·38	0·37	0·74	16·49	7·50	8 15 0	Cuming, Smith and Co. Pty. Ltd., 65 William-street, Melbourne,
,, ,, ..	Mt. Lyell, M.L. in diamond, No. 1	..	2·50	..	..	..	2·50	15·38	0·37	0·74	16·49	7·50	8 15 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, No. 1 ..	..	2·50	..	..	..	2·50	15·38	0·37	0·74	16·49	7·50	8 15 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd., No. 1	..	2·50	..	..	..	2·50	15·38	0·37	0·74	16·49	7·50	8 15 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Sickle, No. 2 ..	..	1·00	1·00	..	..	2·00	14·69	0·35	0·72	15·76	5·00	8 0 0	Cuming, Smith and Co. Pty. Ltd., 65 William-street, Melbourne
,, ,, ..	Mt. Lyell, M.L. in diamond, No. 2	..	1·00	1·00	..	..	2·00	14·69	0·35	0·72	15·76	5·00	8 0 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
,, ,, ..	Federal, No. 2 ..	..	1·00	1·00	..	..	2·00	14·69	0·36	0·71	15·76	5·00	8 0 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
,, ,, ..	Wischer and Co. Pty. Ltd. No. 2	..	1·00	1·00	..	..	2·00	14·69	0·35	0·72	15·76	5·00	8 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
,, ,, ..	Sickle, No. 3 ..	..	..	..	2·00	..	2·00	8·45	2·61	3·78	14·84	6·25	9 0 0	Cuming, Smith, and Co. Pty. Ltd., 65 William-street, Melbourne

LIST OF FERTILIZERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FERTILIZERS ACT 1915 (No. 2652) FOR THE YEAR 1928—*continued.*

Description of Fertilizer.	Brand.	Nitrogen.						Phosphoric Acid.				Potash.	Price asked per ton.	Where obtainable.
		As Nitrate.	As Ammonia.	As Blood.	As Blood and Bone.	As Bone and Flesh.	Total.	As Water Soluble.	As Citrate Soluble.	As Citrate Insoluble.	Total.			
Containing Nitrogen, Phosphoric Acid, and Potash—continued.		%	%	%	%	%	%	%	%	%	%	%	£ s. d.	
Complete Manure ..	Mt. Lyell, M.L. in diamond, No. 3	..	..	..	2·00	..	2·00	8·45	2·61	3·78	14·84	6·25	9 0 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal, No. 3 ..	..	..	..	2·00	..	2·00	8·45	2·61	3·78	14·84	6·25	9 0 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd., No. 3	..	..	..	2·00	..	2·00	8·45	2·61	3·78	14·84	6·25	9 0 0	Wischer and Co. Pty. Ltd., 499 Little Collins-street, Melbourne
„ „ ..	Sickle, No. 4 ..	..	1·00	..	1·40	..	2·40	11·27	1·96	4·02	17·25	5·00	8 15 0	Cuming, Smith and Co. Pty. Ltd., 65 William-street, Melbourne
„ „ ..	Mt. Lyell, M.L. in diamond, No. 4	..	1·00	..	1·40	..	2·40	11·27	1·96	4·02	17·25	5·00	8 15 0	Mt. Lyell Mining and Railway Co. Ltd., 381 Little Collins-street, Melbourne
„ „ ..	Federal, No. 4 ..	..	1·00	..	1·40	..	2·40	11·27	1·96	4·02	17·25	5·00	8 15 0	Nobel (Australasia) Ltd., 380 Collins-street, Melbourne
„ „ ..	Wischer and Co. Pty. Ltd., No. 4	..	1·00	..	1·40	..	2·40	11·27	1·96	4·02	17·25	5·00	8 15 0	Wischer and Co. Pty. Ltd , 499 Little Collins-street Melbourne,
Mixed Manure ..	Cresco	..	1·50	..	..	..	1·50	9·60	1·40	8·70	19·70	7·50	7 12 6	Cresco Fertilizers Ltd., 110 Nth. Terrace, Adelaide, South Australia
„ „ ..	Cresco, No. 2 ..	..	1·00	..	1·40	..	2·40	11·25	2·00	4·50	17·75	5·00	8 10 0	Cresco Fertilizers Ltd. 110 Nth. Terrace, Adelaide, South Australia
Horticultural Manure ..	Sickle	..	3·00	..	..	..	3·00	10·78	0·26	0·53	11·57	10·00	9 15 0	Cuming, Smith and Co. Pty. Ltd., 65 William-street, Melbourne

Description of Fertilizer.	Brand.	Nitrogen.	Phosphoric Acid.	Mechanical Condition.		Price asked per ton.	Where Obtainable.
				Fine Bone.	Coarse Bone.		
		%	%	%	%	£ s. d.	
Bonedust	Ox	3·75	22·50	24·00	76·00	7 10 0	Peter Brown, Grey-street, Hamilton
,, ...	J. A. Dundas ..	4·42	21·15	35·00	65·00	9 10 0	J. A. Dundas, Dynon-road, Footscray
,, ...	Fitzgerald ..	3·90	21·00	38·00	62·00	9 10 0	P. Fitzgerald and Sons, Warrigal-road, Bentleigh
,, ...	King's Geelong ..	3·87	20·68	34·00	66·00	9 10 0	Joseph C. King and Sons Pty. Ltd., Little Fyans-street, South Geelong and Marshall
,, ...	Bendigo, Rohs in circle	4·00	18·00	45·00	55·00	9 10 0	P. Rohs Pty. Ltd., Bendigo Bone Mills, Grassy Flat, Bendigo
,, ...	Eclipse	3·27	24·59	69·40	30·60	9 10 0	Thomas Albert Mills, Spec Gully, Golden Square
,, ...	Nova	3·75	18·00	30·00	70·00	9 10 0	H. C. Pannifex and Co., 26 Market-street, Melbourne
,, ...	Pannifex	4·00	20·00	20·00	80·00	9 17 6	H. C. Pannifex and Co., 26 Market-street, Melbourne
,, ...	Echuca	4·25	16·75	42·00	58·00	9 0 0	William George Boyle, Gouldbourne-road, Echuca
,, ...	Pioneer	3·05	23·68	28·00	72·00	8 0 0	William Abraham Rainey, Mepunga East
,, ...	Bailey Bros., Mt. Clear	3·00	18·00	30·00	70·00	8 0 0	Bailey Bros., Mt. Clear
,, ...	Cockatoo	3·81	18·65	41·00	59·00	7 0 0	R. Fordham, Cressy-road, Camperdown

Melbourne, 7th December, 1927

P. RANKIN SCOTT,
Chemist for Agriculture.

IMPROVEMENT OF SCOTTISH PIG INDUSTRY.

The following article relating to the report by the Scottish Pig Industry Committee on questions of breeding, management, feeding, and marketing of pigs is taken from the August number of *The Farmer and Stockbreeder*:—

The Scottish Pig Industry Committee, having carefully examined avenues of approach to greater and more profitable production, has issued its final report. The decisions come to are of general application.

The committee has considered the matter in all its bearings, and the report covers the questions of breeding, type, feeding, management, housing, disease, and marketing.

The committee was the result of a conference following the embargo upon the importation of fresh pig carcasses, and members were elected from all bodies interested. The report proceeds to note the causes of failures in the past. The farmer, they say, too often does not breed the right kind of pig; his feeding methods are faulty; his marketing methods are haphazard and fail to co-ordinate the home supply with the home demand. Such shortcomings must be corrected before substantial progress can be made. What, then, are their recommendations?

The committee recognizes that considerable improvements have taken place in the breeding of pigs during the last decade. There is still, however, a deplorable lack of discrimination in pig-breeding up and down the country. The result of this lack of foresight is that the home supplies are of such a heterogeneous nature that only a comparatively small percentage are really first-class bacon pigs. The fresh pork market, taken as a whole, is, perhaps, not so exacting as the bacon market in the type and weight of pig it demands, but the fresh pork market is easily over-supplied. The bacon market, on the other hand, while more precise in its specifications, provides a more or less unlimited outlet for fat pigs. For that trade the factories must have—(*a*) Pigs suitably bred and suitably fed to the required weight; (*b*) a steady supply at all seasons. Under existing methods these two provisos are too generally disregarded by feeders, with the consequence that the curer is driven to seek his raw material elsewhere.

Replies from home bacon curers, giving the type of pig preferred, the breed or cross providing the pig nearest to the desired type, the weight of pig required, and the breeds or crosses distinctly unsuitable for bacon purposes, indicate that in almost every case the curers recommend the use of the Large White boar. The Large White boar gives the necessary length and fineness of carcass, which is so desirable for high-grade bacon.

Breed from Pure-bred Stock.—The committee attaches special importance to the advice given by one of the large distributing firms in the country, "to breed only from pure-bred stock. First crosses of any of the more popular breeds in Scotland are generally fairly satisfactory as dual-purpose pigs. Continuous crossing results very often in a mixed litter so far as type and quality are concerned."

For both the bacon and pork trades the committee definitely recommend producers to breed either pure Large White of suitable type or a first cross between a Large White boar and a Middle White sow of the finer type. A first cross between a Large White boar and a Large Black sow is also acceptable to a number of curers. The committee condemn any attempt to go beyond a first cross. The selection of the boar is most important. The old adage still holds good that "the boar is half the herd."

Much controversy has raged round the rival open-air and indoor systems. The committee are satisfied that breeding herds can be kept on the outdoor or open-air system in Scotland all the year round, provided fairly sheltered sites are chosen and dry huts provided. Indeed, they recommend this system as the best method of raising hardy, disease-free stock.

While the outdoor system is suitable all the year round for breeding stock, it is not suitable, except in summer, for feeding pigs. Pigs fed outside under winter conditions require extra feeding to maintain the body heat. It is, therefore, cheaper to feed pigs under comfortable conditions, where a greater proportion of the food goes to the production of pork, or bacon, as the case may be.

The Curers' Complaint.—On referring to the principal curers in Scotland, it is ascertained that only about 50 per cent. of the home pigs they receive are really first-class bacon pigs. The general complaint by curers is that the remaining 50 per cent. are faulty—generally over-weight, over-fat, and of bad conformation. One firm adds: "Farmers and their advisers may confer together and talk, but unless the people can get bacon to their taste they will buy lean, firm meat, no matter where it comes from." Curers state that the unsuitability of such a large proportion of the home produce is due, in great measure, to wrong methods of feeding. In addition, many diseases are deficiency diseases, directly attributable to the use of badly-balanced rations. Expensive artificial feeding stuffs are often used which, although not actually harmful to the health of the pig, result in a finished product which is unsuitable either for pork or bacon.

In a chapter dealing with marketing, the committee refer to the complaints of curers as to "dealer-collected" consignments, the uncertainty of quality and previous feeding, and they (the curers) indicate their preference for dealing with reliable producers direct. Pigs may pass through the hands of several dealers or commission agents —all expecting a profit—before arriving at the point where they are to be slaughtered.

Concerning store pigs, the committee are emphatically of opinion that, in the case of young pigs, there is great need for the development of more direct dealing between the breeder and the feeder. It is well known that the journey to the market, the length of time spent in crates at the market, and the subsequent journey to the feeders' premises are detrimental to the health of the young pig. There is also a greater risk of bringing home disease with pigs that have been bought at a market or from a dealer's premises. The losses in this method of marketing can be eliminated to a very great extent if some simple system were devised whereby feeders requiring weaned pigs could be put in touch

with breeders who have litters for sale. In addition, marketing costs would be saved, and the buyer could see the parents of the litter—a matter of no small importance.

Regulating the Market Supply.—Under the present system of live-stock auctions the producer has little, if any, bargaining power. He has to take the price offered, with the disturbing suspicion—to put it no stronger—that the competition among the buyers is more apparent than real. He has no reliable guide to the trend of the market. There is no attempt on his part to regulate the supply to suit the requirements of particular markets. The dealer may argue that he knows the markets and is capable of catering for their various requirements. The producers and dealers, however, do not pull together. The farmer markets his pigs when he pleases, and the dealer cannot meet requirements if the material is not there. What appears to be necessary is some working arrangement between producers and users.

Inquiries have elicited the fact that large users, such as bacon factories and pork butchers, would welcome an arrangement with producers that would make it easier for them to get into direct touch with each other in connexion with the supply of raw material of the known quality and quantity.

Briefly, then, the following are the suggestions of the committee:—

1. Do not go in and out of pig breeding and feeding. Take the rough of the markets with the smooth.
2. Take advantage of premium schemes for boars.
3. For commercial purposes feed only pure Large Whites or a first cross between a Large White boar and a Middle White sow. Do not produce second crosses.
4. Give breeding pigs ample exercise. The open-air system in sheltered sites with portable huts is eminently suitable for such stock.
5. Sell your store pigs, as far as possible, direct to the feeder.
6. Confine feeding pigs to warm quarters in winter, to ensure rapid progress with an economical ration.
7. Study carefully—and follow—what the colleges and curers say about suitable and unsuitable rations.
8. Grow more crops suitable for pig-feeding.
9. Sell at the correct weight to obtain the maximum price.
10. Aim at a high standard of quality, steadily develop your output, and take an interest in the important question of organizing supplies to the market.

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

If the work has not already been done, the orchard should be kept in constant cultivation so as to conserve the abundant spring rains. Should the summer become hot and dry, this will be a very necessary precaution. Even where the soil had been previously well cultivated, the cultivators should again be run over the surface, as any hot weather will cause the soil to crust, which would be the means of dissipating a very considerable amount of soil water. Every effort should be taken to retain this moisture so that the fruit crops shall have all they require for their perfection. To further attain this end no weeds should be allowed to grow in orchard soils.

BUDDING.

Young trees, or old trees that have been previously cut down in preparation for budding, may be worked towards the end of the month. It is advisable to select dull, cool weather for this operation, so that the sap may run more freely, and that atmospheric conditions may not have too drying an effect on the bud. The operation of budding is a very simple one, and is easily performed. To gain a successful end, the sap should be flowing freely, so that when the cuts are made the bark should "lift" or "run" easily, and without any clinging or tearing of the fibres, and it should separate freely from the wood. The bud selected should be firm and well matured, and should show no signs of premature growth whatever. It should be cut from the scion with a shallow cut, and if any wood be left in the cutting it should be taken out of the bud. A smooth, clean spot should be selected on the bark of the stock, and a T-shaped cut made, the vertical cut being longer than the horizontal one. The bark at the point where the cuts meet should be raised, and the bud inserted between the bark and the wood of the stock. The bud should be gently pressed down into position, and then bound with soft twine, string, or raffia. If the bud be too long for the cut, the top may be cut off level by means of a horizontal cut. With practice it will soon become possible to take the buds so that they will need neither cutting nor trimming.

After two or three weeks the buds should be examined to see if they have "taken"—that is, if the bud has united thoroughly to the stock. When this occurs, the tie may be cut. If a growth be desired at once all wood above the bud may be cut off some short distance above the bud, so as to prevent any bark splitting, and consequent loss of the bud, and so as to throw the bud out at a fair angle. Ultimately this should be properly trimmed.

If desired, the bud may be left dormant throughout the autumn and winter till spring. In this case the branch should not be cut off, but left on till the usual winter pruning.

SUMMER PRUNING.

Care should be observed that as much of the leafage as possible is retained on the tree. Unduly long laterals of fruiting trees may be shortened back, always cutting to a leaf. Unnecessary terminal leader growths, of which there are sometimes three or four, all strong growing, may be reduced to one, retaining this one as a leader. In no case should this growth be cut or interfered with in any way.

The results of these cuts will be to divert the sap which was flowing into growths that would subsequently be pruned, into more profitable channels, so that weak buds and growths may be strengthened, and induced into fruit bearing.

The Vegetable Garden.

The work in this section is much the same as in the flower garden. Good mulching and regular soil stirring will be the work for the month. As soon as any bed is cleared of vegetables it should be manured and well dug over in preparation for the next crop. Deep digging is always desirable in vegetable growing. If any pest, such as aphis, pea mite caterpillars, or tomato weevil, have been present, it would be advisable to burn all the crop refuse, or to destroy any insects that remain, and to give the plot a dressing of gypsum, or of Clift's manurial insecticide.

Keep the tomatoes well watered and manured, pinching out surplus and strong grown laterals. In early districts the onion crop will be ripening. In late districts, or with late crops, the ripening may be hastened by breaking down the top. An autumn crop of potatoes may be planted. Cabbage, cauliflower, lettuce, and celery plants may be planted out. Keep asparagus and rhubarb beds well watered.

The Flower Garden.

January should be a busy month in the garden. It may be necessary to water frequently, and after every watering the surface should be well loosened, and stirred with the hoe to keep it moist and cool. More cultivation and less water is a good rule to be observed. The hoe should be used more, and the hose less, in summer; greater benefits will accrue, and the water bill will be considerably reduced. Mulchings with straw, grass, &c., are very useful just now. The mowings from lawns form valuable mulching. Waste tobacco stems are also valuable as a mulch.

Dahlias, chrysanthemums, gladioli and other tall-growing, slender herbaceous plants will require support in the way of stakes. They will also need mulching considerably. These plants should receive no check whatever, and should be continued with a regular even growth right through the season. Another desideratum is that soils should be well drained, as plants of all descriptions thrive better in well-drained soils.

A sharp look-out should be kept on these plants for attacks of red spider. If this insect appears, a good spraying of tobacco solution or benzole emulsion should be given.

Constant watch will need to be kept for the various small caterpillars that attack the buds of these plants. Spraying with a weak solution of paris green and lime, or similar insecticide, will be useful. Hand-picking should also be resorted to.

REMINDERS FOR FEBRUARY.

LIVE STOCK.

HORSES: *At grass.*—Supplement dry grass, if possible, with some greenstuff. Provide plenty of pure water and shade shelter. *In stable.*—Supplement hard feed with some greenstuff, carrots, or the like, and give a bran mash once a week at least. Avoid over-stimulating foods, such as maize and barley. Give hard feed in quantities only consistent with work to be performed. Stable should be well ventilated. and kept clean. When at work, give water at short intervals. Always water before feeding. Great benefit will result in supplying horses—more especially young ones running at grass—with a lick. The following one is recommended:—

Salt	20 parts
Lime	20 parts
Superphosphate	10 parts
Sulphate of iron	5 parts.

By having troughs constructed that will protect the lick from rain a considerable saving will be made.

Horses at grass require their feet attended to at frequent intervals, otherwise deformity of feet and lameness may result.

CATTLE.—Provide succulent feed and plenty of clean water easy of access; also shade and salt lick in trough. Have each cow's milk weighed and tested for butter fat regularly. Rear heifer calves from those that show profitable results. Give milk at blood heat to calves. Keep utensils clean or diarrhœa will result. Do not give too much at a meal for the same reason. Give half-a-cup of limewater per calf per day in the milk. Let them have a good grass run or lucerne, or half-a-pound of crushed oats in a trough. Dehorn all dairy calves except those required for stud or show purposes. Keep bulls away from cows. Write for Bulletin 52.

PIGS.—Sows about to farrow should be supplied with short bedding in well-ventilated styes. All pigs should be provided with shade and water to wallow in. There will be plenty of cheap feed available now, and there is a good margin between cost of feed and price for fat pigs. Read *Bulletin* No. 16, and special articles in *Journal of Agriculture* for May to October, 1926, inclusive.

POULTRY.—Chickens should now be trained to perch; they will be more healthy.

Provide plenty of green feed and give less grain and meat. Avoid condiments. Keep water in cool shady spot and renew three times each day. Keep dust bath damp.

CULTIVATION.

FARM.—See that haystacks are weatherproof. Summer fallow and prepare land for winter fodder crops. Get tobacco sheds ready for crop. In districts where February rains are good, sow rye, barley, vetches, and oats for early winter feed.

ORCHARD.—Spray for codlin moth. Search out and destroy all larvæ. Cultivate the surface where necessary and irrigate where necessary, paying particular attention to young trees. Fumigate evergreen trees for scale. Continue budding.

FLOWER GARDEN.—Cultivate the surface and water thoroughly during hot weather. Summer-prune roses by thinning out the weak wood and cutting back lightly the strong shoots. Thin out and disbud dahlias and chrysanthemums. Layer carnations. Plant a few bulbs for early blooms. Sow seeds of perennial and hardy annual plants.

VEGETABLE GARDEN.—Continue to plant out seedlings from the seed-beds. Sow seeds of cabbage, lettuce, cauliflower, peas, turnips, and French beans. Keep all vacant plots well dug.

VINEYARD.—February is the best month for the "yema," or summer bud graft (see *Bulletin* No. 35, available on application). Select and mark the best-bearing vines of varieties from which scions will be required for next spring's grafting.

Given suitable climatic conditions, downy mildew will make its appearance. If vines were not sprayed in January they should be sprayed this month. The final spray (January or February) is most important for the protection of the foliage, thus insuring the ripening of the fruit and well-nourished wood, without which a good crop cannot be expected next year. Sulphur again, if oidium is prevalent, but avoid sulphuring wine grapes too short a time before gathering. The sulphur may be mixed with Bordeaux mixture, thus enabling the two diseases, oidium and downy mildew, to be combated simultaneously.

Cellars.—Prepare all plant and casks for the coming vintage. An ounce of bisulphite of potash, or a couple of fluid ounces of bisulphite of soda solution, to each bucket of water used to swell press platforms, tubs, &c., will help to keep it sweet. Keep cellars as cool as possible. Complete all manipulations so as to avoid handling older wines during vintage.

In the case of very hot weather occurring during vintage, attention is directed to the new wine-making method by "Preliminary Maceration," described in a pamphlet obtainable on application.

CITRUS FUMIGATION IN CALIFORNIA.

In California last year 81,500 acres were fumigated and 54,000 acres of citrus were sprayed for various insects at a total cost to the growers of that State of £730,000, according to a statement recently made by R. S. Woglin, Entomologist of the California Fruit-growers' Exchange. Of the above total £460,000 was for fumigation and £270,000 for sprays.

RECORD TOBACCO CROPS IN CANADA.

The Superintendent of the Dominion Experimental Station at Harrow, Ontario, predicts that the tobacco yield in 1927 will break all records, according to a statement appearing in the *Border Cities Star*. Other reports indicate that the acreage in Kent and Essex counties has been greatly increased this year and that tobacco is rapidly supplanting the corn crop. The newspapers of these districts are printing a series of educational articles on the growing of tobacco. Editorials and front-page articles also frequently appear to encourage the farmer to grow tobacco.

CITRUS INDUSTRY IN U.S.A.

In 35 years the citrus fruit crops have increased tenfold, from 5,000,000 to 50,000,000 boxes annually. A series of profitable years during and immediately after the war led to an expansion of acreage which is not yet in full bearing, so the prospect is for considerably increased production within a few years. In the five years from 1920 to 1924 nearly 10,000,000 orange trees were planted in Florida, where the number of trees bearing fruit in 1924 numbered only 7,306,000.

APPLE CANNING INDUSTRY OF U.S.A.

According to a correspondent of the *New York Journal of Commerce*, present indications are that the total apple pack of Oregon and Washington will run more than 1,500,000 cases, and may be substantially greater than that. The total is entirely a matter of ability to secure the raw material and to get the trade to fully cover its requirements while the apples are available to be packed. In a period of six years the canning of apples in the north-west of America has progressed from an experimental industry to where our territory is firmly established as the great apple-canning district of the world. In 1920 the two States canned only 325,733 cases. By 1920 this had progressed to 1,332,733 cases, and in 1926 to 1,356,529 cases. The outlook is for a 1927 pack that will make about 1,500 car loads with a value of close to $4,000,000.

NATIONAL HERBARIUM MELBOURNE

RAPE The Food for Sheep

SOW NOW FOR QUICK GREEN FEED

RAPE is a profitable Winter crop, and is valuable for pasturing sheep during the Winter months

A Great Fattening Food for Horses, Cows, Sheep, Pigs, &c.

Sow now, it will catch the Autumn rains, and will be ready for pasturing in about 10 weeks. A crop is thus available for stocking before the Winter sets in.

Somner's "Tip Top" Giant Kangaroo Rape

We are Original Introducers

A sturdy and rapid grower; it has a strong tap-root, enabling it to stand long periods of drought. Stalks break easily, and are very succulent right through. **Will not taint the milk.** Sow 4 to 6 lbs. per acre in drills; 8 to 12 lbs. broadcast. **Will fatten 3 more sheep per acre than any other kind. 10d. lb.; 80/- cwt.**

Dwarf Essex

Imported English (true), 8d. lb.; 65/4 cwt. Dutch, 7d. lb.; 60/- cwt. New Zealand (from imported English Seed). Finest quality. Grown from pure stock. **7d. lb.; 60/- cwt.**

White Mustard

Prevents Blowing in Sheep. 1 lb. per acre with Rape. **1/6 lb.; 150/- cwt.**

Egyptian or Berseem Clover

"Misskawi" Brand (imported direct), specially re-machine cleaned

A GREAT WINTER FODDER

Recommended as an annual Winter Clover for warm countries where irrigation is practised. Valuable for its green or dried fodder, and as a winter soiling crop for orchards, vineyards, &c., on irrigated land. A strong-growing annual, with succulent, fleshy stems and broad, soft leaves. The flowers are cream or pale yellow in colour, and are clustered together in a compact, cylindrical spike.

The first cut is available from 45 to 60 days after sowing, followed by a second and third cut, and sometimes a fourth, although the latter is never heavy, and is usually reserved for seed. All kinds of stock eat it readily, and it may be given to them at any stage of growth; it does not taint milk in the slightest degree. This Clover will re-seed itself in a pasture on good land, and thus becomes practically permanent.

Fallow must be thoroughly clean prior to seeding. Sow through the drill, but care should be taken to see that the points of the drill are kept just on the surface of the ground.

Graze lightly, or cut when plants are a few inches high. They will then stool out well. **Sow 8 to 12 lbs. per acre in drills, or 20 to 30 lbs. broadcast.**

1/3 lb.; 120/- cwt.

LAW, SOMNER Pty. Ltd.

Established over 78 Years

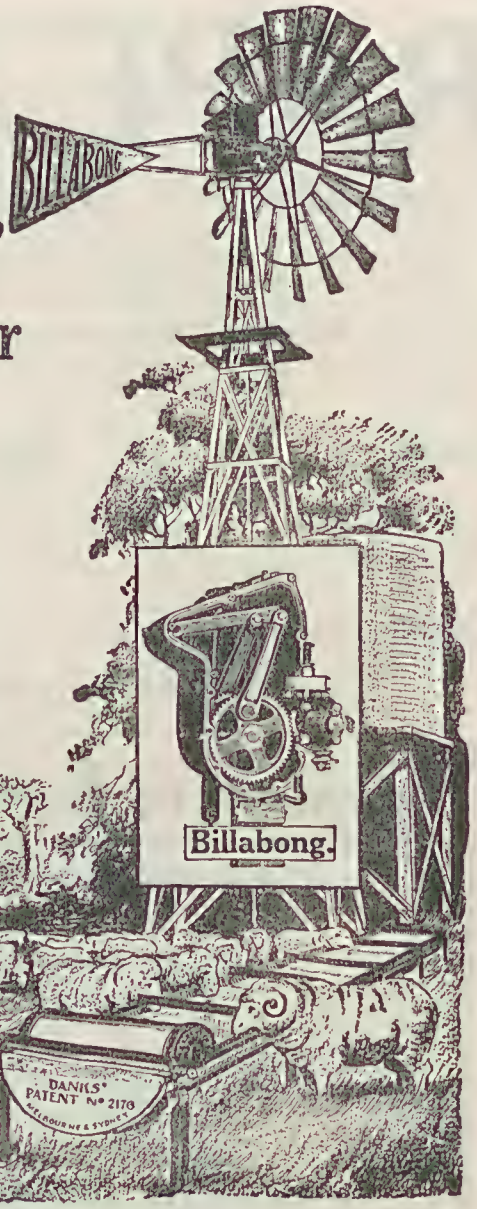
Seed Merchants and Nurserymen
Block Place & Swanston St., Melbourne

The leading Agricultural Seed House in Victoria

Responds to lightest breeze;
Safe in any gale

THE

"Billabong" Encased-Gear Windmill



Expert engineers put the "Billabong" FIRST as an engineering achievement. It is Double-Geared and the gears run in an Oil Bath. The Encased-Gear "Billabong" with its perfect lubrication will give many extra years of service.

Full particulars and price post free.

"BILLABONG" EXTRA STRONG TROUGHING

The "BILLABONG" Extra Strong Troughing gives the Farmer extra value for his money It is made in four types—Cattle, Calves, Sheep, and Pig. Get full particulars and prices from—

JOHN DANKS & SON PTY. LTD.

391-403 BOURKE STREET - MELBOURNE
324-330 PITT STREET - - - SYDNEY

The Utmost Economy In Tractor Maintenance

The utmost economy in Tractor maintenance can only be attained by the consistent use of none but the Highest Grades of Fuel and Lubricants.

SHELL R.C.D. Tractor Oil will halve your Tractor Lubrication Costs by maintaining perfect lubrication for twice the usual working period.

Port Vincent, S.A.

"Having just overhauled three large tractors which have been working under similar conditions with a heavy load for three months, I notice that the tractor using R.C.D. Oil was easily in the best condition when taken down and the sump showed no apparent signs of dilution."

(Sgd.) A. C. PERRY
(Engineer)

In every State under practical working conditions "Cross" has proved its unquestionable superiority for power and economy. This outstanding merit is due to the perfect vaporisation of "Cross," which ensures the maximum power output, minimises crankcase dilution, and lengthens the life of your tractor.

SHELL

R.C.D
RESISTS - CRANKCASE - DILUTION

Tractor Oil

CROSS

POWER

KEROSENE

The British Imperial Oil Company Limited—Throughout Australia CK87

DEPARTMENT OF AGRICULTURE

GOVERNMENT COOL STORES

VICTORIA DOCK

The Stores have a capacity of **743,980 cubic feet insulated,** and are capable of holding **372,000 boxes of butter,** or **248,000 cases of fruit,** or **335,000 carcasses of lamb and mutton.**

Electric motor power totals 900 H.P.

Produce can be placed on conveyors at any point and mechanically carried to any chamber in the building, or conveyed from the chambers direct into the ship's hold.

The Railway Department Goods Sheds are adjacent to and connected with the Cool Stores by direct lines; delay and exposure of produce through shunting in the Spencer-street yards, or cartage, are thus avoided. The Stores are situated in close proximity to the Victoria Dock, where vessels drawing up to 30 feet of water can be berthed; excellent facilities for the efficient and economical treatment and shipment of frozen and perishable products are provided.

Expert Officers are connected with every Branch, so that any one requiring information regarding the production, preparation, and shipment of produce can rely upon being promptly supplied with up-to-date information upon all matters.

DEPARTMENT OF AGRICULTURE

GOVERNMENT COOL STORES

VICTORIA DOCK

Facilities are provided for producers and smaller exporters of the various kinds of produce, so that direct shipments on their own account may be undertaken. The Government ownership and conduct of Cool Stores places producers in an independent position, and, in addition, preserves an open channel for the carrying on of the export trade in perishable products.

The Department of Agriculture will receive, handle, freeze, store, and ship **Butter, Cheese, Eggs, Fruit, Meat, Poultry, Rabbits and Hares, &c.,** for producers and exporters.

Produce to the value of over **£30,000,000** has been treated at the **Government Cool Stores.**

GOVERNMENT COOL STORES, VICTORIA DOCK (Dudley St.)

Telephones:

Office : 10383 Central. **Superintendent and Engineer-in-Charge : 10382 Central.**

SCALE OF CHARGES, ETC.

and further particulars may be obtained upon application to the

EXPORTS SUPERINTENDENT, DEPARTMENT OF AGRICULTURE, PRODUCE OFFICES, 605-7 FLINDERS STREET, MELBOURNE.

Telephone, 9380 Central.

BARK

Consign your Bark to

S. P. REYNOLDS & CO.

Bark Merchants and Tanners

MACAULAY ROAD, NORTH MELBOURNE

HIGHEST PRICES PAID FOR

BEST BLACK & GOLDEN WATTLE

Consign direct to "Reynolds," Goldsbrough Mort's Siding, Macaulay

IN DRY WEATHER YOUR STOCK NEED **Molasses** LARGE BARRELS (about 6 cwt.) 50/-

Try our "**MOLLERNE**"

The Ideal Fodder for all Stock

A TRIAL TON AT £8 WILL WORK WONDERS

Write for Particulars and Samples at once—

QUEENSLAND MOLASSES CO. 363 FLINDERS STREET 'Phone 4528 MELBOURNE

BRUNNING BEST FOR BEARING FRUIT TREES

(True to Name and Healthy)

ARE PLANTED THROUGHOUT AUSTRALASIA

Shipments made to all Parts of the World

JOHN BRUNNING & SONS *Established 60 Years*

SOMERVILLE NURSERIES, SOMERVILLE, VICTORIA — AUSTRALIA

THE STATE SAVINGS BANK OF VICTORIA

CREDIT FONCIER LOANS

ON FARM PROPERTIES

Up to two-thirds of valuation in sums from £50 to £2,000, repayable by instalments spread over 27½ years.

Interest 6 per cent.

Special Terms for Discharged Soldiers and Dependants, also those who were in the **Red Cross** and **Transport Services,** up to three-fourths of valuation, repayable by instalments spread over 30¼ years.

Interest 5¾ per cent.

NO CHARGE FOR MORTGAGE DEED

Application forms at any Branch of the State Savings Bank or by writing to the General Manager.

Head Office:
139-149 Elizabeth Street, Melbourne.

GEO. E. EMERY,
General Manager.

ESTABLISHED 1878

THE Trustees Executors & Agency Co. Ltd.

412 COLLINS STREET, MELBOURNE

Directors:

SIR JOHN GRICE, Chairman.
SIR J. H. MACFARLAND, M.A., LL.D., Vice-Chairman.
R. O. BLACKWOOD D. STUART MURRAY ALEXANDER STEWART
J. FORDYCE

Empowered by Special Acts of Parliament to operate in the States of New South Wales and Victoria.

The Company specializes in the management of farms and station properties

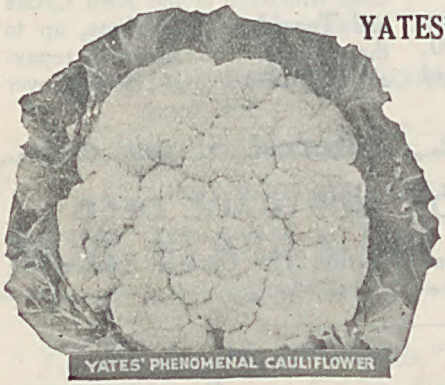
Please call or write for explanatory booklet.

CHAS. R. SMIBERT,
General Manager.

V. G. WATSON,
Manager.

CABBAGES and CAULIFLOWERS

For Early Market Sowings



YATES' "PHENOMENAL EARLY" CAULIFLOWER

A very fine early variety maturing in about four months. The heads are of good size, close-grained, and of splendid colour. We have received numerous reports about the good qualities of this and **"Phenomenal Maincrop"** and they are rapidly becoming the two biggest sellers in our list.

YATES' "PHENOMENAL MAINCROP" CAULIFLOWER

A magnificent maincrop cauliflower which, in our opinion, will soon be the standard maincrop variety in Australia. It matures in about six months and the results which have been obtained with this variety even in difficult seasons, have been remarkable.

Both Varieties—5/- oz. 15/- ¼ lb. 45/- lb.
3 lb. lots, 42/- lb. 7 lb. lots, 40/- lb. 14 lb. lots, 37/6 lb.

SUCCESSION CABBAGE: P. HENDERSON'S AMERICAN GROWN

This seed is imported direct from the originator each season and only this seed is supplied under this name.

4/- oz. 12/- ¼ lb. 37/6 lb. 3 lb. lots, 35/- lb.

YATES' "VANGUARD" CABBAGE

A fine early market sort producing a splendid quality short-stemmed cabbage with very solid round heads. Heads in surely and evenly and can be planted fairly close together.

2/- oz. 6/6 ¼ lb. 20/- lb. 3 lb. lots, 18/- lb.
7 lb. lots, 17/- lb. 14 lb. lots, 16/6 lb.

All quotations submitted and all orders accepted are subject to our printed conditions of sale.

ARTHUR YATES & Co. Ltd.

Letters Box 2707C G.P.O.

Australia's Greatest Seed House,
184–6 SUSSEX ST., SYDNEY

Wires "SEEDSMAN," SYDNEY

By Authority: H. J. GREEN, Government Printer, Melbourne.

DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter *fat* yielded. Thus a calf from a cow with a 400 lb. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

SIRES IN USE:

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lb.; 1917, 398 lb.; 1918, 419 lb.; 1919, 479 lb.; 1920, 428 lb.; 1921, 562 lb.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking) 7144 lb. milk.

Dam's Dam's	,,	14533 lb. milk	...	4	years	average	12871 lb. milk.
Sire's Dam's	,,	10370	,,	... 7	,,	,,	9354	,,
Sire's D. Dam's	,,	9510	,,	... 12	,,	,,	8033	,,
G. Sire's D. Dam's	,,	10215	,,	... 7	,,	,,	9386	,,
G.G. Sire's D. Dam's	,,	12565	,,	... 10	,,	,,	8853	,,
G.G.G. Sire's D. Dam's	,,	10088	,,	... 2	,,	,,	9754	,,

BIT O' 'BACCA (Vol. 3)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Nictitana (311 B.) by Nicotine (69 A.A.).

Nictitana's butter fat records for 6 successive lactation periods are as follow:—1918, 450 lb.; 1919, 396 lb.; 1920, 393 lb.; 1921, 465 lb.; 1922, 524 lb.; 1923, 536 lb.

Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

Application for purchase to

Dr. S. S. CAMERON, DIRECTOR OF AGRICULTURE, MELBOURNE.

LET VICTORIA'S

FAMOUS FLIER

Take You for a Holiday
to Victoria's

AZURE COAST

LORNE
ANGLESEA
BARWON HEADS
OCEAN GROVE
TORQUAY
APOLLO BAY
PORTLAND
PORT CAMPBELL
PETERBOROUGH
WARRNAMBOOL
PORT FAIRY

Up-to-date road services connect where necessary

CONSULT THE

GOVERNMENT TOURIST BUREAU

QUEEN'S WALK (opp. Town Hall), MELBOURNE

'PHONE C.2898

SP
630-5
V645